MITSUBISHI ELECTRIC

Mitsubishi Programmable Controllers

MELSEC **Q** series

MELSEC PROCESS CONTROL / REDUNDANT SYSTEM

Empowering Industries

CC-Línk **IE**

MELSOFT

CC-*Link*

ISO 14001
JACO
AUDIT AND CERTIFICATION ORGANIZATION, FOR ENVIRONMENT AND QUALITY · JAPAN
U K A S
ENVIRONMENTAL MANAGEMENT
051
EC97J1113

ISO 9001
BUREAU VERITAS Certification
BUREAU VERITAS
1828
U K A S
QUALITY MANAGEMENT
008

MELSEC changes process control capability, from dedicated system to Mitsubishi programmable controllers.

Cost reduction

Mitsubishi programmable controllers give users the flexibility to configure the system according to their needs, unlike a distributed control system (DCS), which is completely developed by the vender from the initial design phase. This can greatly reduce initial and running costs.
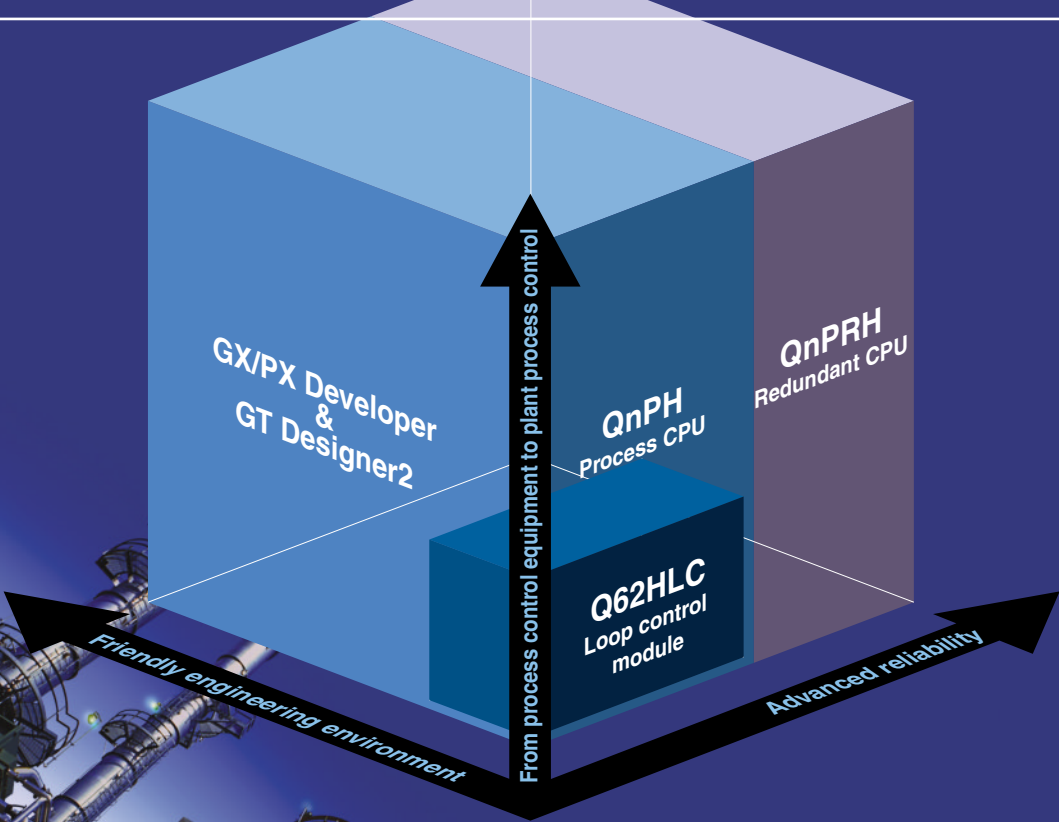
Advanced process control

Detailed process control matching the state of the process from simple to complicated loop control can be realized.

Highly reliable system

System reliability can be increased with redundancy of the basic system, including the CPU module, power supply module, base unit, and network module.

MELSEC PROCESS CONTROL / REDUNDANT SYSTEM

GX/PX Developer & GT Designer2

QnPH Process CPU

QnPRH Redundant CPU

Q62HLC Loop control module

Friendly engineering environment

From process control equipment to plant process control

Advanced reliability

Needs
Designing a process control system with programmable controllers.

▌ Process control functionality like DCS

▌ Easy to create loop control programs

▌ Reducing costs (initial, maintenance, and modification)

▌ Maintaining reliability of DCS

Solutions
MELSEC process control provides loop control, analog processing, and simple engineering functions. Moreover, highly reliable system can be configured using the redundant CPUs.

▌ **Loop control**
The process CPU and redundant CPU realize high-speed loop control and high-speed sequence control with a high level of reliability. Also, the high function analog modules feature channel isolation, high accuracy, high resolution, and disconnection detection function.

▌ **Maintenance**
The analog, I/O, temperature control modules, etc. can be replaced while the control system is online. Therefore, the CPU does not need to be stopped or turned off.

▌ **Simple engineering functions**
PX Developer facilitates creating loop control programs. Just paste and connect FBs by dragging and dropping. (No need for ladder programming) Additionally, tuning and monitoring the loop control are available for each tag on the standard screen.

▌ **Redundant system**
The redundant system (including the CPU module, power supply module, base unit, and network module) can maximize the system uptime. It can be programmed just like a single system.

Needs
Reducing space requirement and improving system monitoring and operability.

▌ Minimizing space required for control panel installation

▌ Improving system monitoring and operability
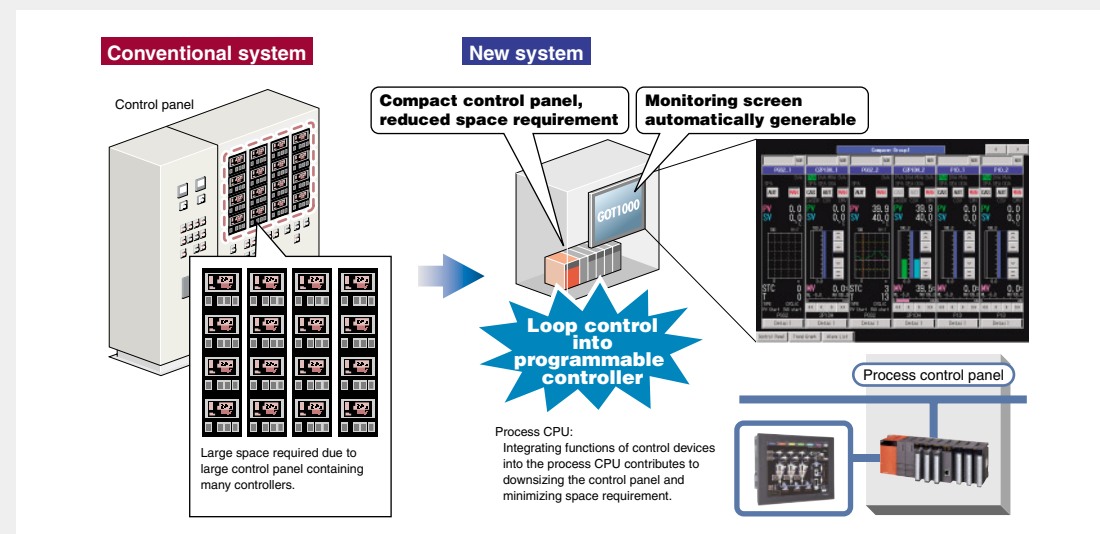
Solutions
Integrating control into programmable controllers reduces space requirement. Also, the HMI can enhance monitoring and operability.

▌ **Reduced space requirement**
The ultra compact Q Series can reduce space requirement for the control panel.

▌ **Enhanced monitoring and operability**
In addition to the conventional adjustors, alarm list, event list, trend graph, etc. can be displayed, improving monitoring and operability.

Conventional system

New system

Control panel

Compact control panel, reduced space requirement

Monitoring screen automatically generable

GOT1000

Loop control into programmable controller

Process control panel

Large space required due to large control panel containing many controllers.

Process CPU: Integrating functions of control devices into the process CPU contributes to downsizing the control panel and minimizing space requirement.

Needs
Integrating loop control and sequence control.

▌ Easy to design, modify, and maintain a system containing both loop and sequence control. Current system is designed using separate controllers for each control.

· Separate software required for each controller
· Complicated programming for data communication between controllers

➡ Program design, modification, and maintenance are time-consuming.

▌ System scalability: expandable to other applications such as motion control and information control.

Solutions
A single process CPU can execute both loop and sequence control. Also, the multiple CPU system is ideal for expanding application.
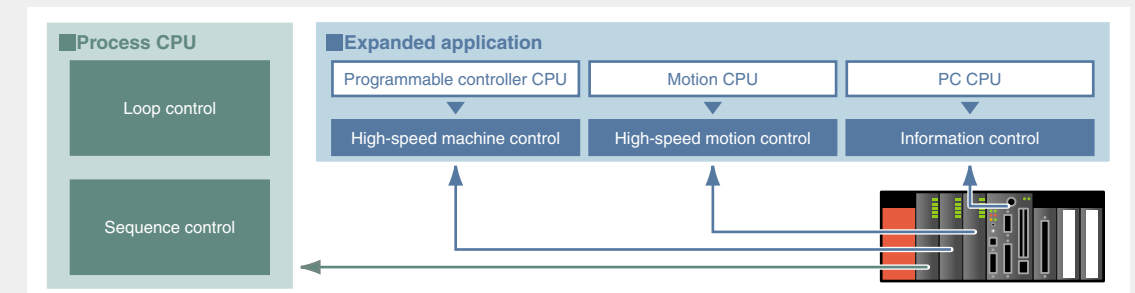
▌ **Integration of loop control and sequence control**
The process CPU and redundant CPU can execute multiple programs. Therefore, loop and sequence control can be performed simultaneously at high speed.

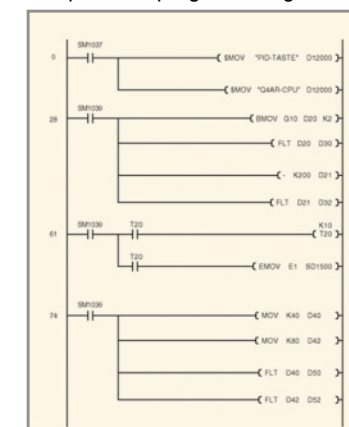▌ **High expandability with multiple CPU system**
All Q Series modules can be used for the multiple CPU system, realizing high expandability, usability, and maintainability. The application can be expanded to high-speed motion control (motion CPU), information control (PC CPU), etc.
✻ The redundant CPU does not support the multiple CPU system.

■Process CPU

Loop control

Sequence control

■Expanded application

Programmable controller CPU | Motion CPU | PC CPU

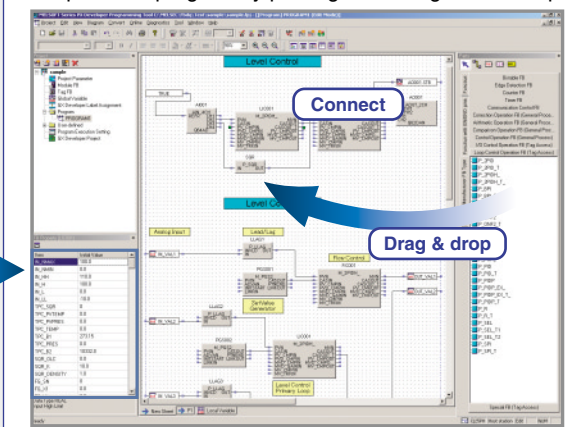High-speed machine control | High-speed motion control | Information control

Conventional engineering
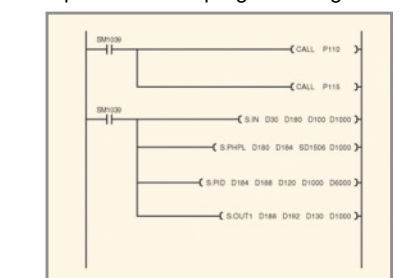
Loop control program using ladder

Engineering with MELSEC process control

Loop control program by pasting FBs using PX Developer

Connect

Drag & drop

Sequence control program using ladder

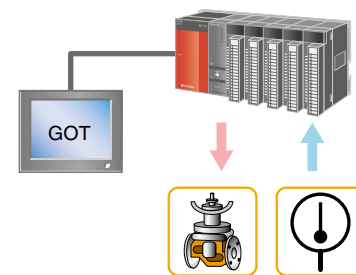Sequence control program using ladder

Food processing

Functions previously configured with a programmable controller and temperature controller can be integrated into a single process CPU. Using together with the GOT, a monitoring system with superior operability can be configured while downsizing the equipment.

System configuration

GOT
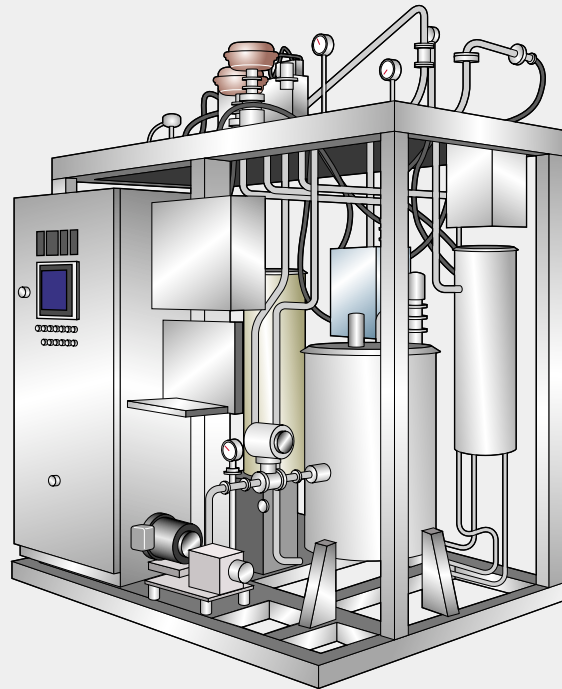
Industrial furnace

Process control by substantial loop control instructions and sequence control at high-speed control cycle are available. Program control, combustion control, and power control can be realized with a single process CPU.

System configuration

Ethernet

GOT
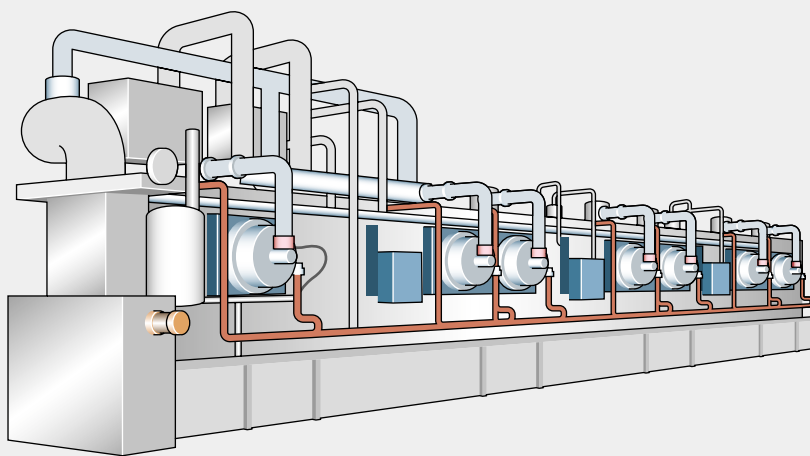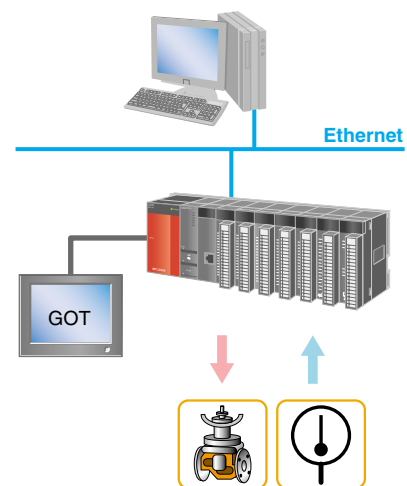
Fine chemical manufacturing

Providing an integrated solution from process automation to factory automation for manufacturing chemicals, such as medicines, paint, cosmetics, and detergent. Initial and running costs can be reduced.

Production

Automated warehouse

Packing

System configuration

PC based HMI (Monitoring)

Ethernet

CC-Link IE Controller Network

CC-Link IE Controller Network

CC-Link IE Controller Network

Tracking cable **Redundant system**

GOT GOT

Tracking cable **Redundant system**

MELSECNET/H Remote I/O Network

GOT

GOT GOT

CC-Link CC-Link

SSCNET

CC-Link CC-Link

| Production | Packing | Automated warehouse |
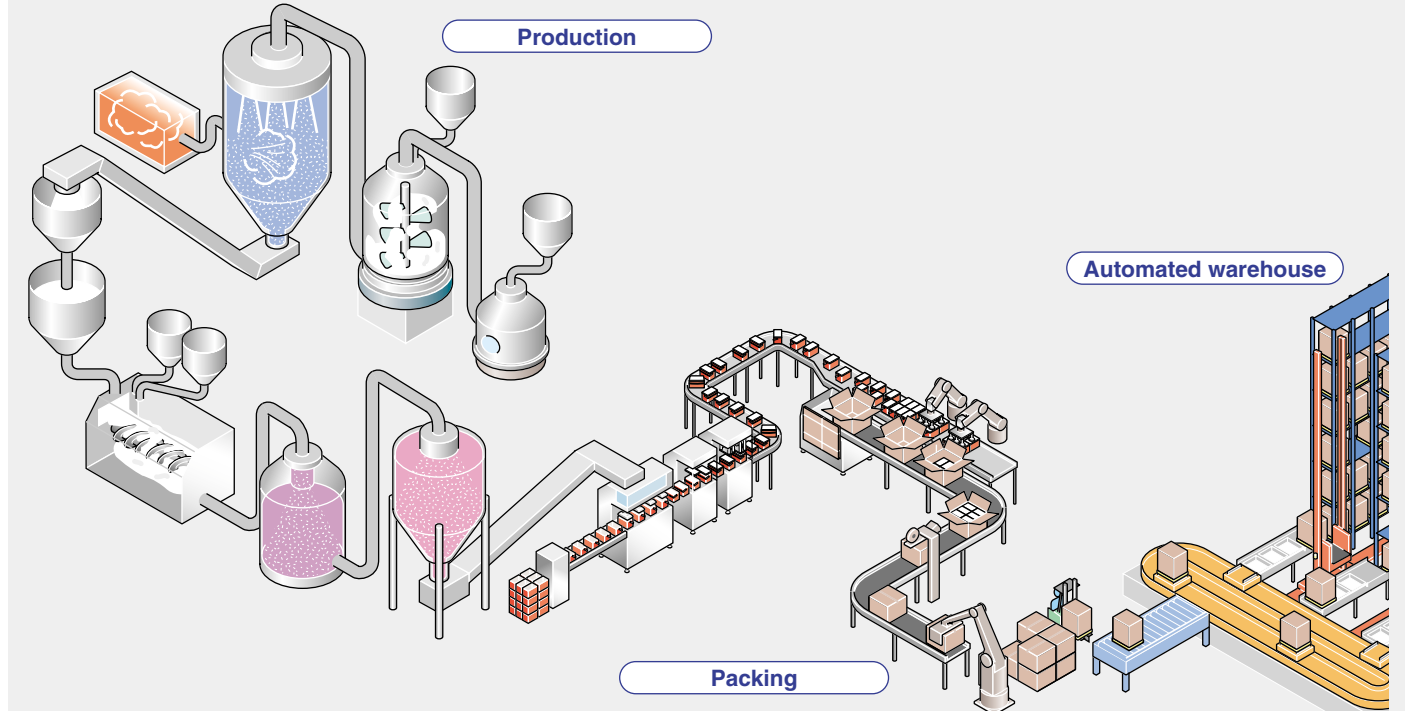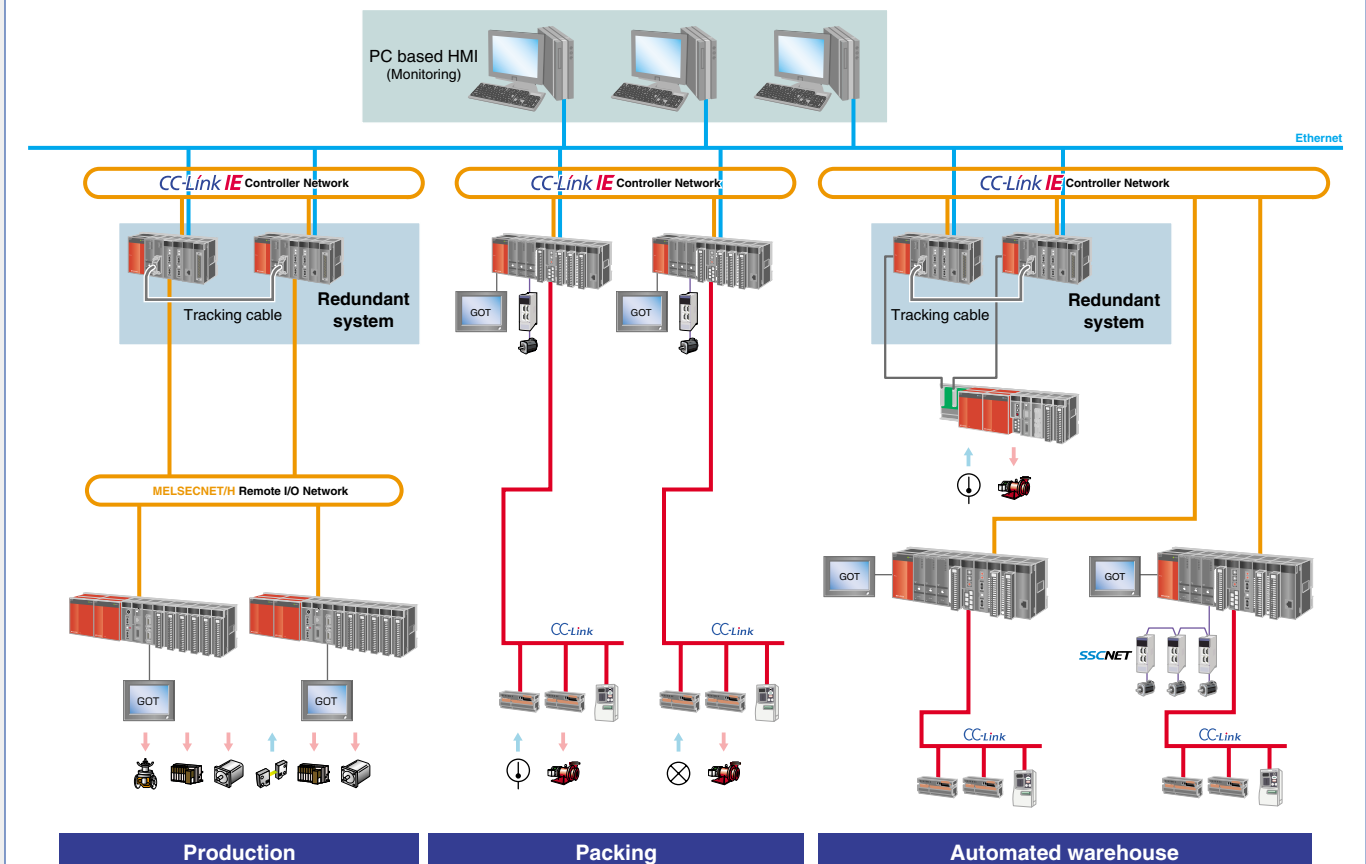
Water treatment

Configuring a system for safe and stable water supply and sophisticated operation with highly reliable redundant CPUs.

Primary sedimentation tank

Park

Secondary sedimentation tank

Sludge treatment facility

Discharge

Sedimentation tank

Chlorine contact tank

Aeration tank

Advanced treatment facility

System configuration

PC based HMI (Monitoring)

Ethernet

Switching hub

Tracking cable — Redundant system

Tracking cable — Redundant system

Tracking cable — Redundant system

Tracking cable — Redundant system

MELSECNET/H Remote I/O Network

MELSECNET/H Remote I/O Network

MELSECNET/H Remote I/O Network

MELSECNET/H Remote I/O Network

GOT

CC-Link IE Controller Network

GOT

Water tank, coarse filter, fine filter, water pump

Blower, tank, chlorination

Recycling sludge pump, secondary sedimentation tank, sewage pump

Filtration, water recycling tower, pressure pump, adjustment

Waste incineration

Achieving an optimal system configuration according to the scale of the waste disposal plant etc. Environmental solutions flexibly responding to diversified and high-level needs are provided.
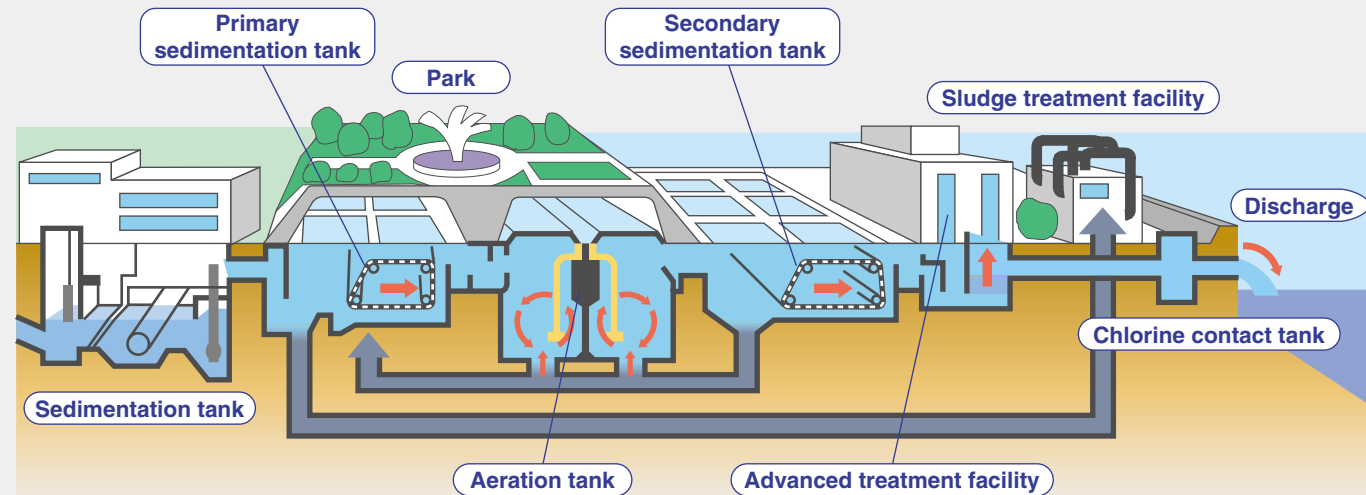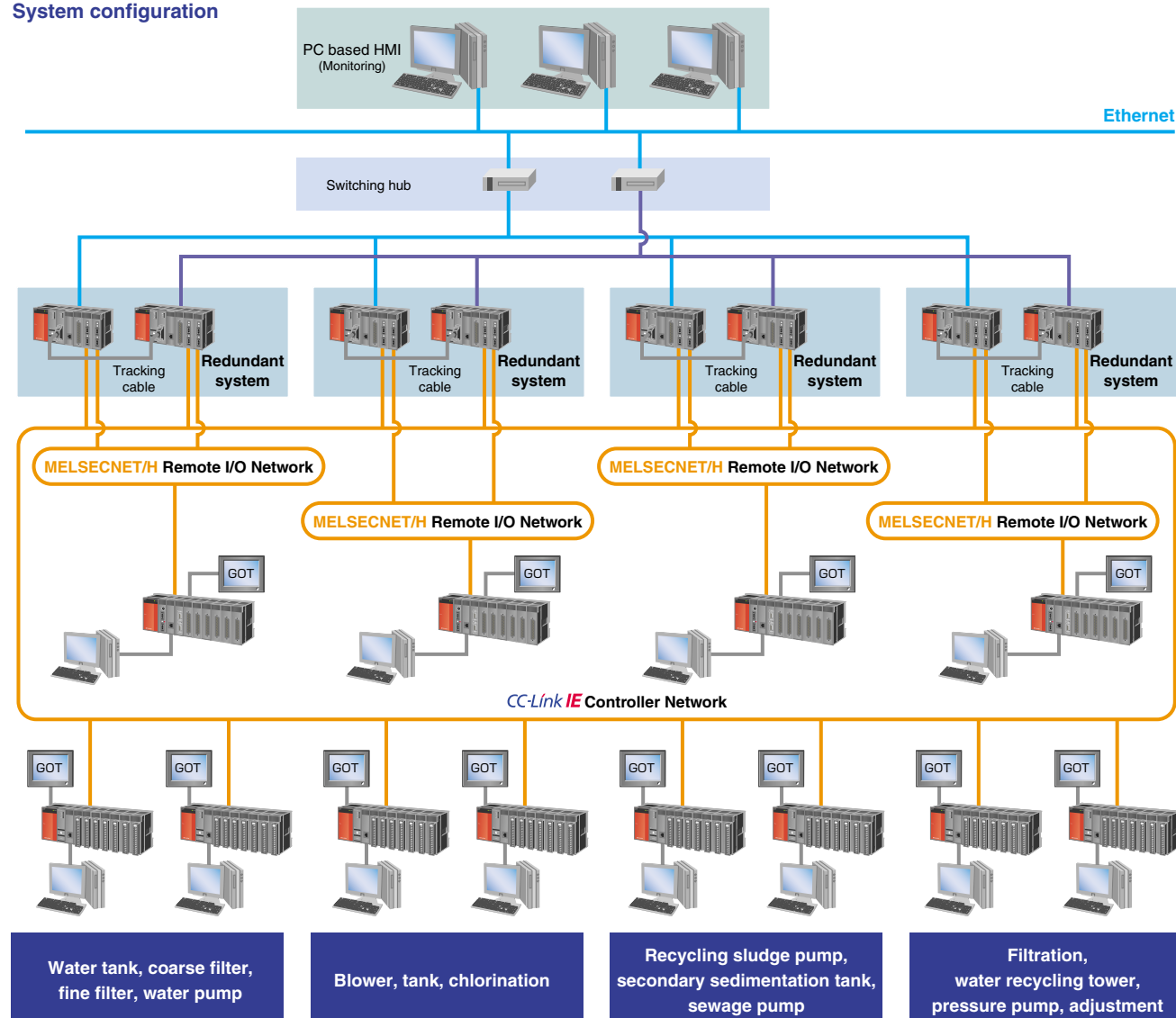
Dehydrated cake

Stack

Metering feeder

Cyclone

Combustion air preheater

Smoke prevention air preheater

Inducted draft fan

Incinerator

Dust collector

Melting furnace

Stack gas treatment tower

Fuel tank

Incineration air blower

Air preheater fan

Slag

Incinerated ash

Drainage

Water

System configuration

Printer

PC based HMI (Monitoring)

Ethernet

CC-Link IE Controller Network

CC-Link IE Controller Network

GOT

GOT

Tracking cable — Redundant system

Tracking cable — Redundant system

MELSECNET/H Remote I/O Network

MELSECNET/H Remote I/O Network

GOT

GOT

GOT

GOT

Temperature sensor, flow sensor, pressure sensor, inverter, control valve, etc.

Semiconductor manufacturing

Enhancing reliability of purified water supply, wastewater treatment, and gas supply facilities by a redundant system. The redundant system can continue operation even if one of the programmable controllers fails.

- Special gas supply
- Semiconductor manufacturing plant
- Ultrapure water system
- Wastewater treatment
- Waste gas treatment

System configuration
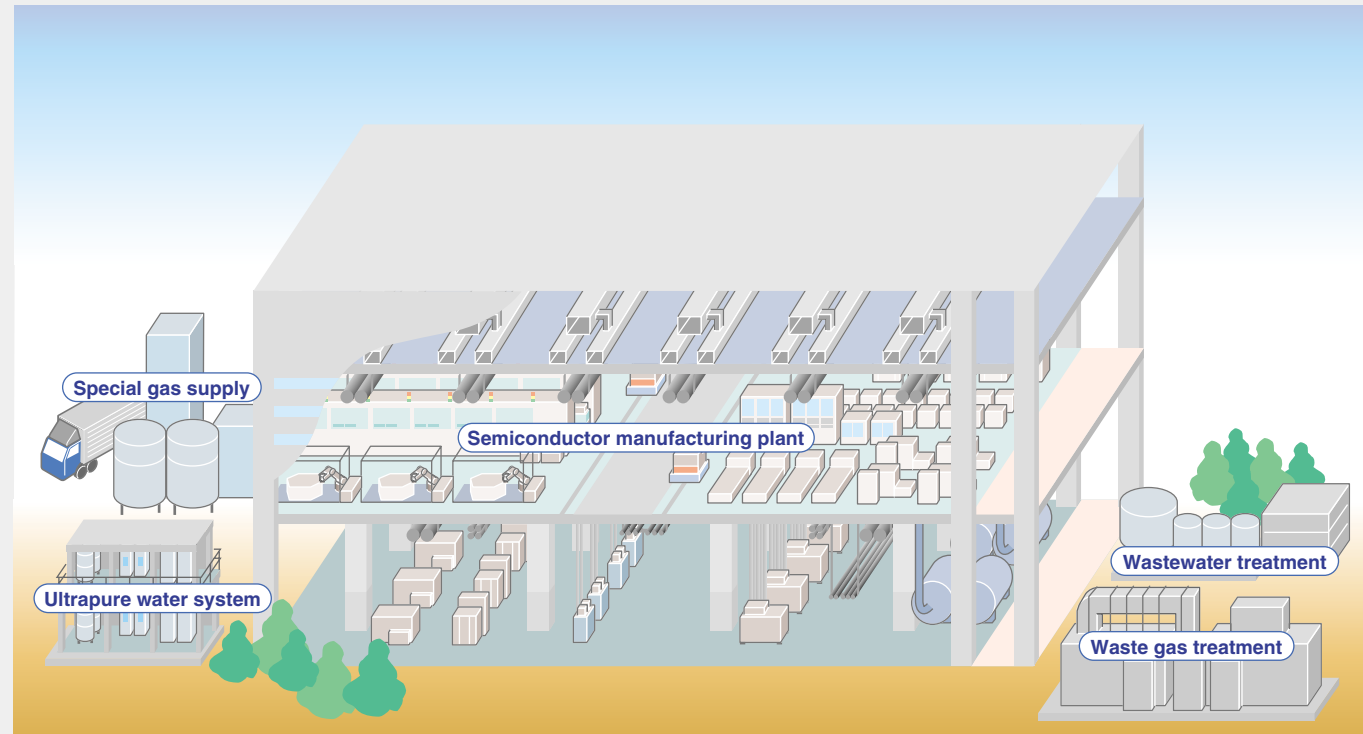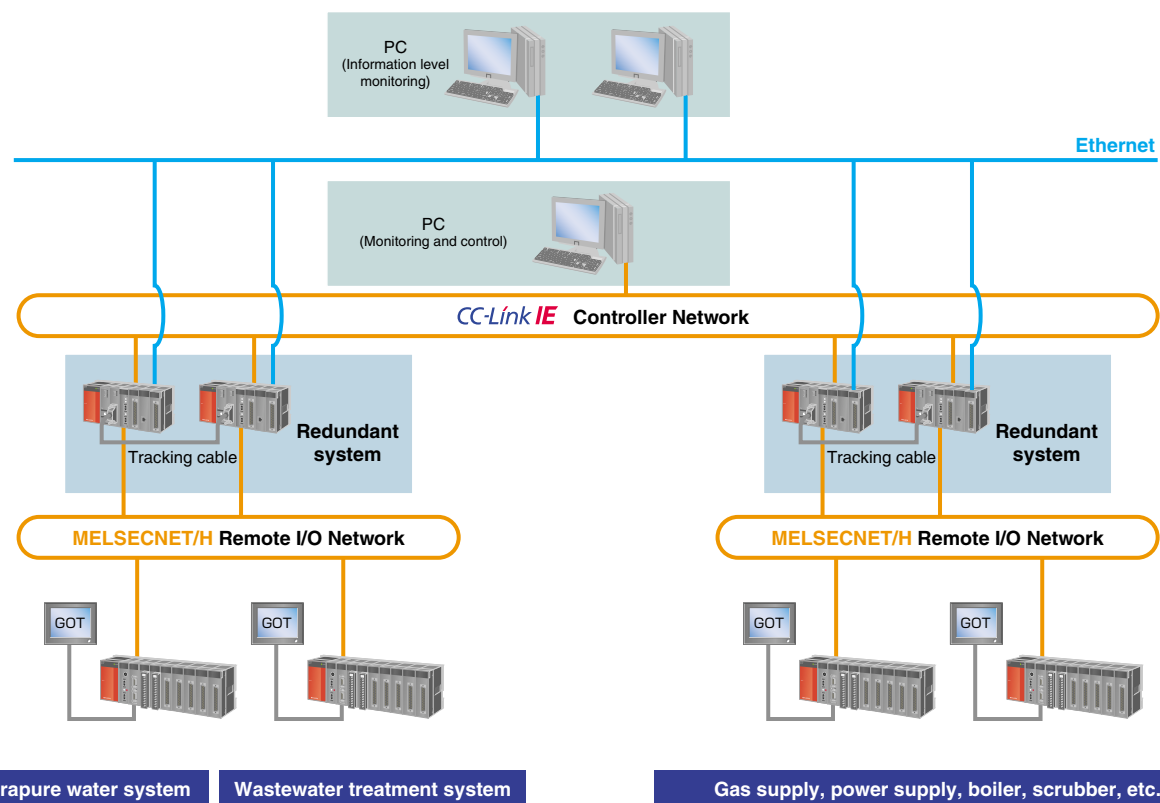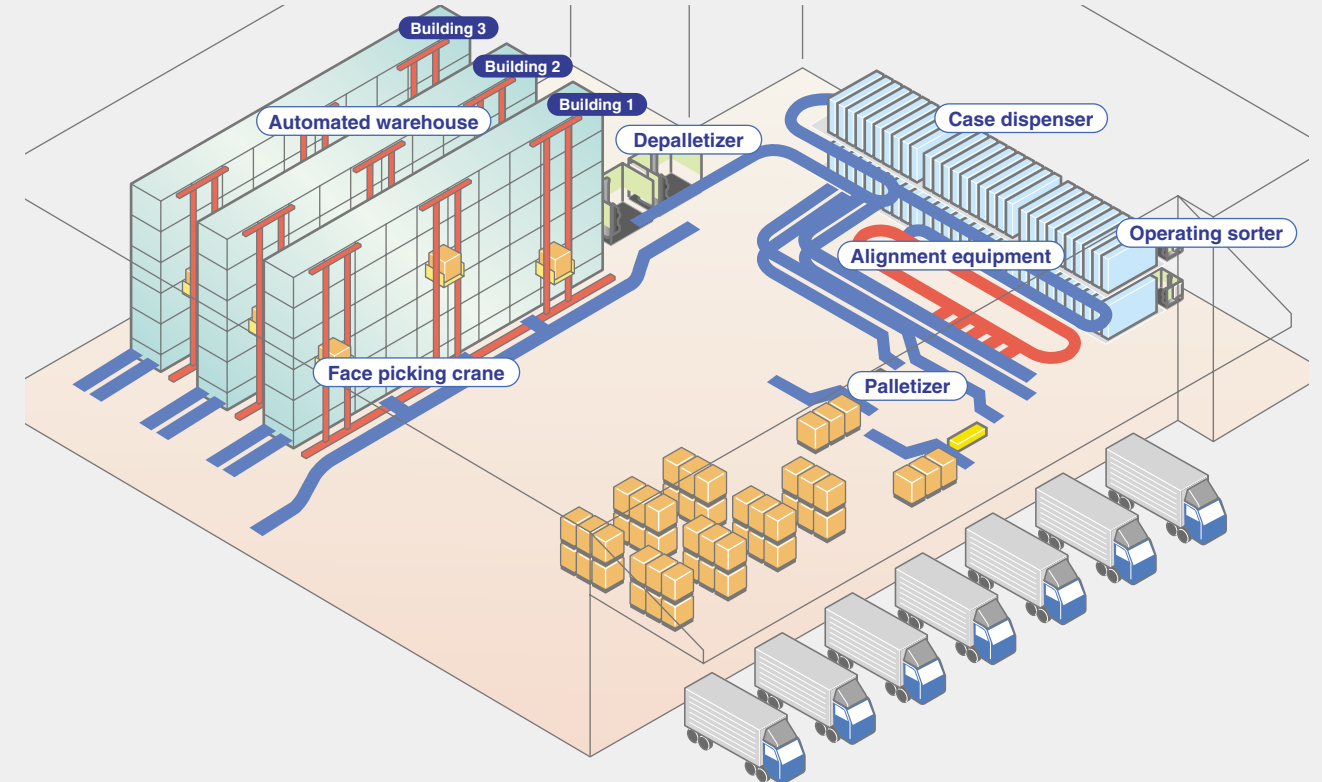

PC (Information level monitoring)

Ethernet

PC (Monitoring and control)

CC-Link IE Controller Network

Redundant system
Tracking cable

Redundant system
Tracking cable

MELSECNET/H Remote I/O Network

MELSECNET/H Remote I/O Network

GOT   GOT

GOT   GOT

Ultrapure water system | Wastewater treatment system

Gas supply, power supply, boiler, scrubber, etc.

Material handling

Providing steady operation for material handling by a redundant system. This reduces delay in loading/unloading even if one of the programmable controller fails.

- Building 3
- Building 2
- Building 1
- Automated warehouse
- Depalletizer
- Case dispenser
- Alignment equipment
- Operating sorter
- Face picking crane
- Palletizer

System configuration

Ethernet

PC based HMI (Information management)

CC-Link IE Controller Network

Tracking cable   Redundant system

Tracking cable   Redundant system

Tracking cable   Redundant system

MELSECNET/H Remote I/O Network

MELSECNET/H Remote I/O Network

MELSECNET/H Remote I/O Network

GOT   GOT   GOT

GOT   GOT   GOT

GOT   GOT   GOT

Control in building 1

Control in building 2

Control in building 3

A group control system for each building

Supporting a diverse range of applications from PA (process automation) to FA (factory automation)

PC for monitoring and engineering

PX Developer ➡ P.29
(Process control FBD software package)

Supports designing, debugging, monitoring, and maintaining the FBD language loop control programs.

GX Developer ➡ P.35
(MELSEC programmable controller programming software)

Supports designing, debugging, monitoring, and maintaining the ladder diagram/SFC/ST/FB sequence programs.

MX Component ➡ P.36
(ActiveX® library for programmable controller communication)

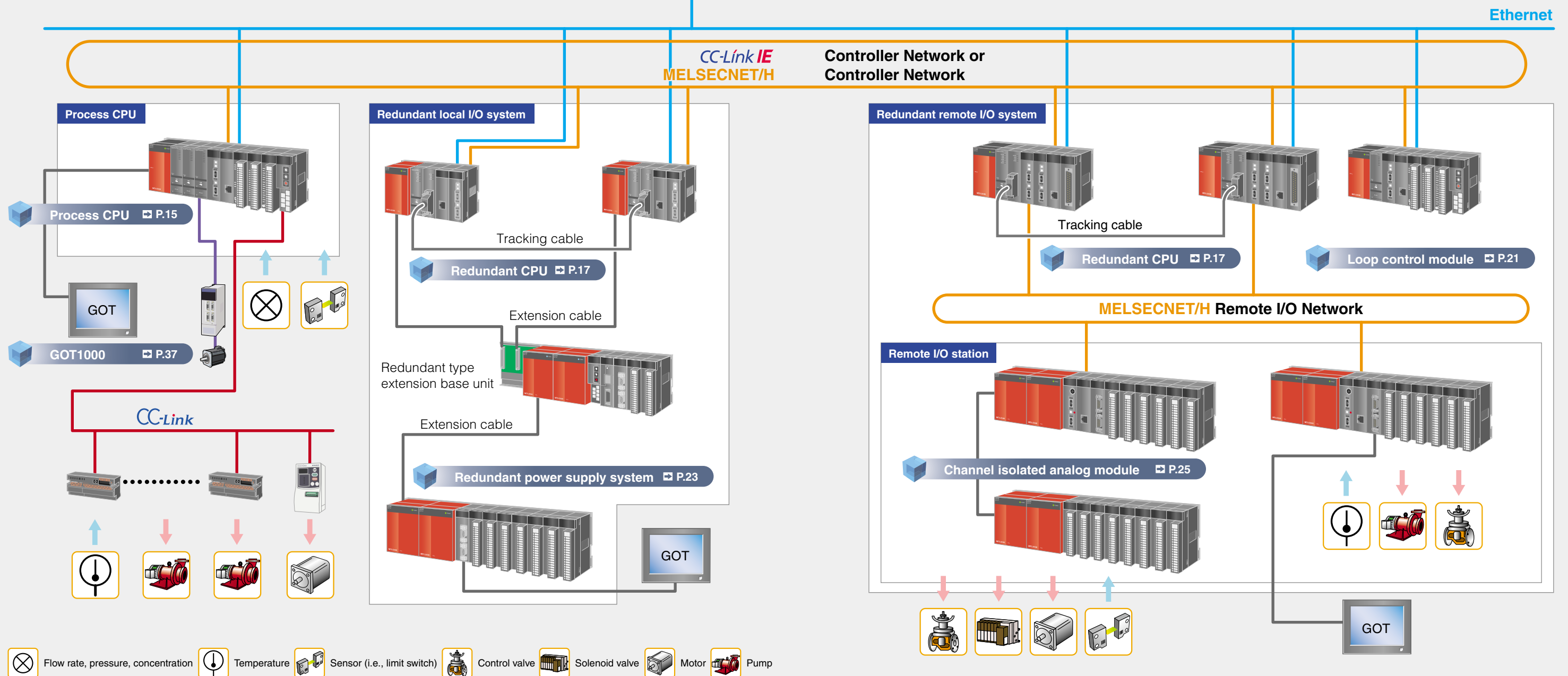Directly links the shop floor to the office, speeding up the operation.

GT SoftGOT1000 ➡ P.38
(HMI software)

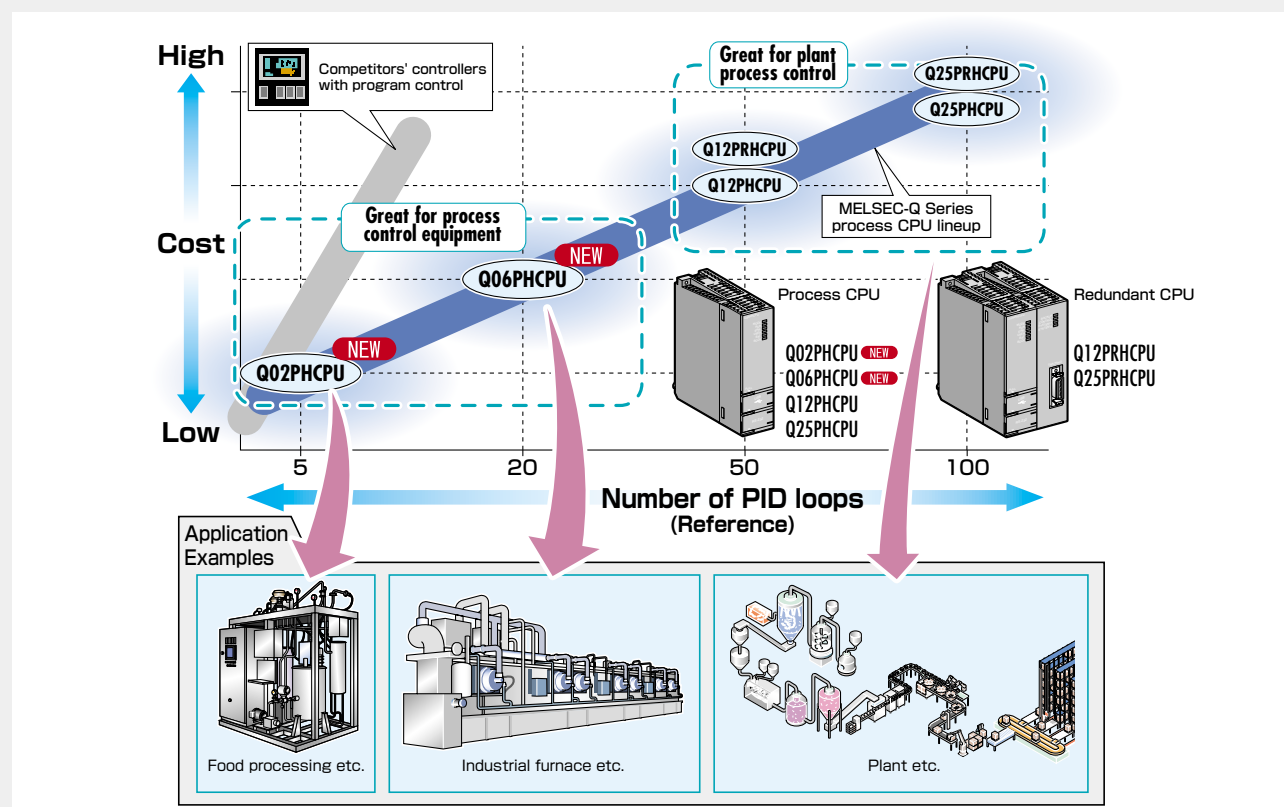Implements the GOT functions on a personal computer.

GT Designer2 ➡ P.38
(Integrated screen drawing software)

Supports designing from GOT screen creation to debugging.

Ethernet

CC-Link IE
MELSECNET/H
Controller Network or Controller Network

Process CPU

Process CPU ➡ P.15

GOT

GOT1000 ➡ P.37

CC-Link

Redundant local I/O system

Tracking cable

Redundant CPU ➡ P.17

Extension cable

Redundant type extension base unit

Extension cable

Redundant power supply system ➡ P.23

GOT

Redundant remote I/O system

Tracking cable

Redundant CPU ➡ P.17

Loop control module ➡ P.21

MELSECNET/H Remote I/O Network

Remote I/O station

Channel isolated analog module ➡ P.25

GOT

Flow rate, pressure, concentration   Temperature   Sensor (i.e., limit switch)   Control valve   Solenoid valve   Motor   Pump

CPU (process & redundant)

Optimal CPU can be selected according to the number of loops and the scale of sequence control, reducing costs.

High

Cost

Low

Competitors' controllers with program control

Great for plant process control

Q25PRHCPU
Q25PHCPU
Q12PRHCPU
Q12PHCPU

MELSEC-Q Series process CPU lineup

Great for process control equipment

NEW Q06PHCPU

Process CPU

Redundant CPU

NEW Q02PHCPU

Q02PHCPU **NEW**
Q06PHCPU **NEW**
Q12PHCPU
Q25PHCPU

Q12PRHCPU
Q25PRHCPU

| 5 | 20 | 50 | 100 |

Number of PID loops
(Reference)

Application Examples

Food processing etc.

Industrial furnace etc.

Plant etc.

Modules best suited for loop control

A wide selection of channel isolated analog modules are provided to support various loop control needs.

	Analog input module					Analog output module	Loop control module
	Current/voltage input	Thermocouple	RTD	With signal conditioning function (2-wire transmitter connectable)		Current/voltage output	
8CH	Q68AD-G	Q68TD-G-H01	**NEW** Q68RD3-G				
6CH				Q66AD-DG		Q66DA-G	
4CH	High resolution Q64AD-GH	Q64TD	Q64TDV-GH	Q64RD-G			
2CH				High resolution Q62AD-DGH		Q62DA-FG	Q62HLC

Cost efficient

High function

MELSEC-Q Series modules
The process/redundant CPU can be used together with the Q Series modules. Common spare parts can be used for the existing system and new system, lowering maintenance costs.

· Usable with parameter settings (program not needed).
· Continues loop control even if the CPU stops due to an error.

＊For detailed information on each module, please refer to the related brochures or manuals.
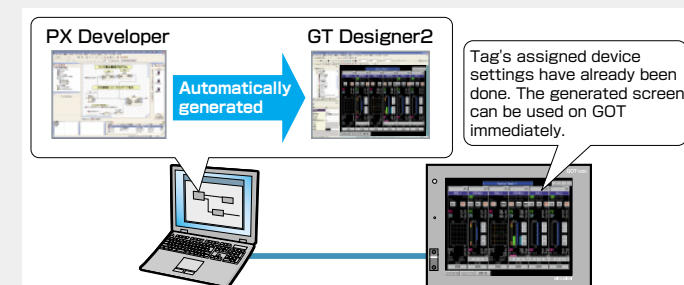
Process monitoring solutions

MELSEC process control monitoring solutions facilitate the monitoring system configuration and improve monitoring operability.

Category	Application	Solution	Feature
Shop floor monitoring	Simple monitoring	GOT1000 Series GOT screen generator function	· Excellent environmental resistance · Compatible with high resolution (15" XGA) · Automatically generates process control monitoring screens for GOT1000
Central monitoring		Combination of PX Developer Monitor tool and SoftGOT SoftGOT interaction function	· Graphic screen creation by familiar GT Designer2 · Capable of sharing (or utilizing) shop floor monitoring and graphic data
	High function monitoring	Commercial SCADA InTouch interaction function	· Various monitoring functions available · Links to enterprise system

GOT screen generator function

GOT's process control monitoring screens can be automatically generated from loop control programs created by PX Developer. Time-consuming device assignment for screen designing and ladder programs for control are no longer needed, substantially reducing engineering time.
See page 33 for details.

PX Developer → GT Designer2
Automatically generated

Tag's assigned device settings have already been done. The generated screen can be used on GOT immediately.
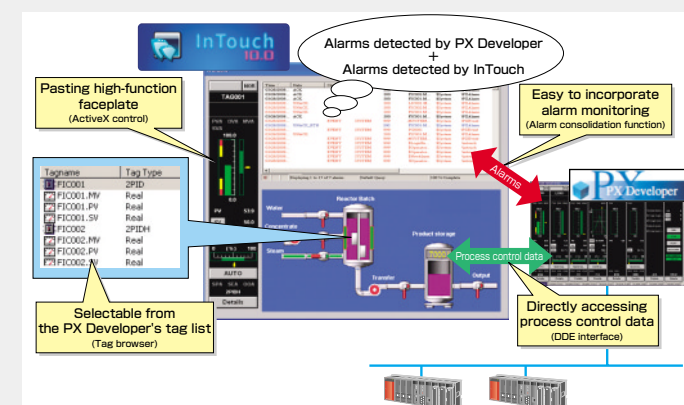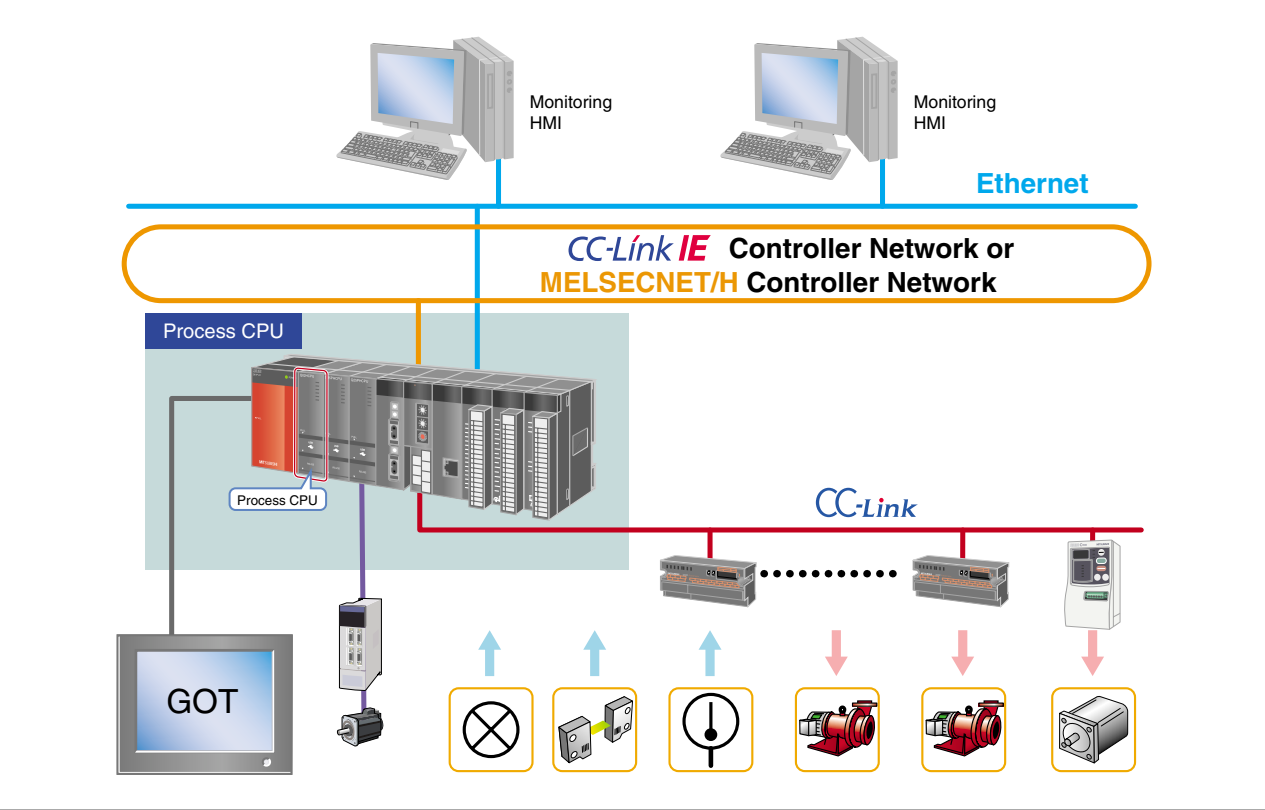
SoftGOT interaction function

GT SoftGOT1000 can be used as a process control graphic monitoring function of the Monitor tool. By switching screen/calling, both tools are integrated and GOT screen data created for shop floor monitoring can be utilized. Users can create graphics and make PX Developer function call settings using familiar GT Designer2.

InTouch interaction function

The interaction function between the PX Developer Monitor tool and Wonderware® InTouch (SCADA software) allows the use of user-friendly, great development/monitoring environment of InTouch in addition to the basic monitoring functions of the Monitor tool.

Pasting high-function faceplate (ActiveX control)

Alarms detected by PX Developer
+
Alarms detected by InTouch

Easy to incorporate alarm monitoring (Alarm consolidation function)

Selectable from the PX Developer's tag list (Tag browser)

Directly accessing process control data (DDE interface)

MELSEC Process Control Products

Process CPU

Monitoring HMI

Monitoring HMI

Ethernet

CC-Link IE Controller Network or MELSECNET/H Controller Network

Process CPU

Process CPU

CC-Link

GOT

Features

1 Integrated loop control and sequence control

· A single CPU can execute multiple programs, realizing simultaneous operation of loop control and sequence control at high speed.
· The multiple CPU system allows the process CPU to be used for more applications by combining with high-speed motion control (motion CPU), information control (PC CPU), etc.

2 Extensive loop control

· The process CPU features a variety of instructions (52 types), such as 2 degree of freedom PID, sample PI, and auto-tuning, supporting loop control.

3 High-speed loop control

· With high-speed processing of approx. 400 μs/loop (for 2 degree of freedom PID loop), a maximum control cycle of 10 ms can be achieved. Therefore, more loops can be executed simultaneously. Also, the process CPU supports processes requiring high-speed control cycle, satisfying more application needs.

4 Improved reliability and maintainability

· When an analog or I/O module fails, it can be replaced without stopping or turning off the CPU. (Note 1) (Operation on GX Developer is required.)
· Holding output at stop error can be set for each module with the parameter.

5 Simple engineering

· With process control FBD software package (PX Developer), a loop control system can be easily built.

6 Utilization and expandability

· The process CPU can be used together with all Q Series modules. Therefore, it can be used in a wide range of applications.

7 Wide range of lineup

· From equipment to plant, an optimal CPU is selectable for your application.

8 Improved total system throughput

· The process CPU modules support high-speed, high-capacity network, CC-Link IE Controller Network, to allow high-speed communication with FA systems. This can shorten operation cycle and improve productivity.

Note 1) Online module change function (Function version restrictions)

Product name	Restrictions
Input module	No restrictions
Output module	
I/O composite module	
Analog input module	Version C
Analog output module	
Temperature input module	
Temperature control module	
Channel isolated pulse input module	

Note 2) First five digits of the serial number must be 10042 or later to use the CC-Link IE Controller Network module.

Secifications

Item			Q02PHCPU NEW	Q06PHCPU NEW	Q12PHCPU	Q25PHCPU
Control method			Sequence program control method			
I/O control mode			Refresh			
Program language	Sequence control language		Ladder, list, ST, SFC			
	Process control language		Process control FBD (Note 1)			
Processing speed	Sequence instruction (Note 2)	LD instruction	34 ns			
		MOV instruction	102 ns			
		Floating point addition	782 ns			
	Process instruction (loop process time)	2 degree of freedom PID	400 μs			
		Basic PID	350 μs			
Program capacity	Number of steps		28 k steps	60 k steps	124 k steps	252 k steps
	Number of programs		28	60	124	252 (Note 3)
Built-in memory	Standard RAM		128 k bytes		256 k bytes	
	Standard ROM		112 k bytes	240 k bytes	496 k bytes	1008 k bytes
Loop control specifications	Process control instructions		52			
	Control cycle		10 ms or more/control loop (setting available per loop)			
	Main functions		2 degree of freedom PID control, cascade control, auto-tuning function, feed forward control			
Number of I/O device points (Note 4)			8192 points			
Number of I/O points (Note 5)			4096 points			
Internal relay [M]		(Note 6)	8192 points			
Latch relay [L]			8192 points			
Link relay [B]			8192 points			
Timer [T]			2048 points			
Retentive timer [ST]			0 points			
Counter [C]			1024 points			
Data register [D]			12288 points			
Link register [W]			8192 points			
Annunciator [F]			2048 points			
Edge relay [V]			2048 points			
File register	[R]	Standard RAM	Max. 65536 points can be used by block switching in units of 32768 points (R0 to 32767)		Max. 131072 points can be used by block switching in units of 32768 points (R0 to 32767)	
		SRAM card (1 MB)	Max. 517120 points can be used by block switching in units of 32768 points (R0 to 32767)			
		SRAM card (2 MB)	Max. 1041408 points can be used by block switching in units of 32768 points (R0 to 32767)			
		Flash card (2 MB)	Max. 1041408 points can be used by block switching in units of 32768 points (R0 to 32767)			
		Flash card (4 MB)	Max. 1042432 points can be used by block switching in units of 32768 points (R0 to 32767)			
	[ZR]	Standard RAM	65536 points (R0 to 65535), block switching not required		131072 points (R0 to 131071), block switching not required	
		SRAM card (1 MB)	517120 points (R0 to 517119), block switching not required			
		SRAM card (2 MB)	1041408 points (R0 to 1041407), block switching not required			
		Flash card (2 MB)	1041408 points (R0 to 1041407), block switching not required			
		Flash card (4 MB)	1042432 points (R0 to 1042431), block switching not required			
Link special relay [SB]			2048 points			
Link special register [SW]			2048 points			
Step relay [S]			8192 points			
Index register [Z]			16 points			
Pointer [P]			4096 points			
Interrupt pointer [I]			256 points			
Special relay [SM]			2048 points			
Special register [SD]			2048 points			
Function input [FX]			16 points			
Function output [FY]			16 points			
Function register [FD]			5 points			
Number of mountable CPU modules			Max. 4			
Number of mountable modules			Max. 64			
Number of extension base stages			Max. 7			

Note 1) PX Developer is required for programming by FBD.
Note 2) The processing time is the same even when the device is indexed.
Note 3) Up to 124 programs can be executed.
Note 4) Indicates the total number of I/O points on the main base unit and extension base units directly controlled by the CPU module and the number of I/O points controlled as remote I/O via the remote I/O network.
Note 5) Indicates the number of I/O points on the main base unit and extension base units directly controlled by the CPU module.
Note 6) Indicates the number of points in the defalut state. This can be changed with the prameters.

Software packages

PX Developer is used together with GX Developer.
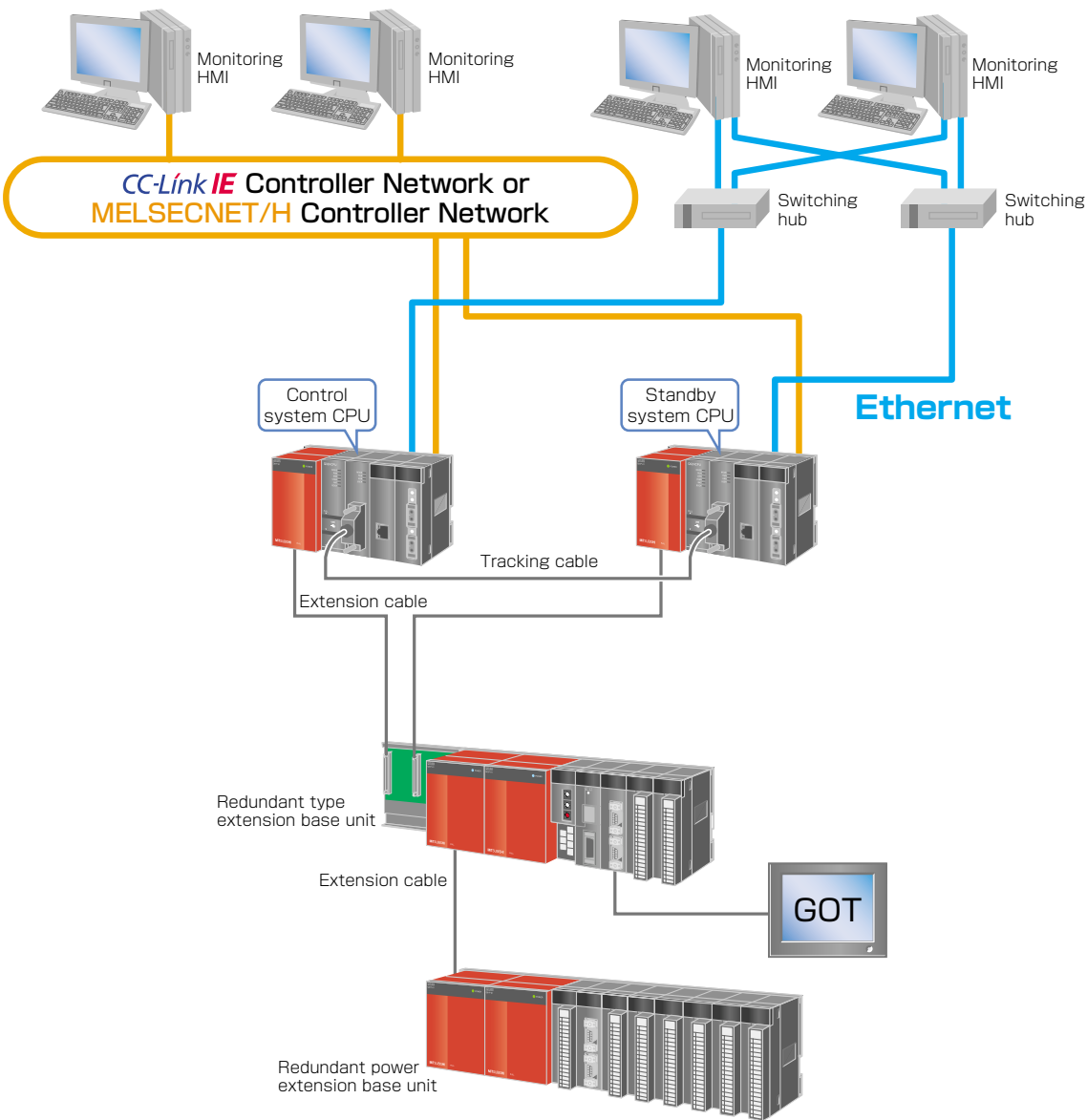The following version or later is required for programming the process CPU.

Product name	w/ CC-Link IE connection	w/o CC-Link IE connection	
		Q02/06PHCPU	Q12/25PHCPU
GX Developer	Version 8.68W or later	Version 7.20W or later	
PX Developer	Version 1.18U or later	Version 1.00A or later	

Redundant CPU

Redundant CPU, network, and power supply systems are provided to support various system configurations specific to application requirements.

Redundant local I/O system

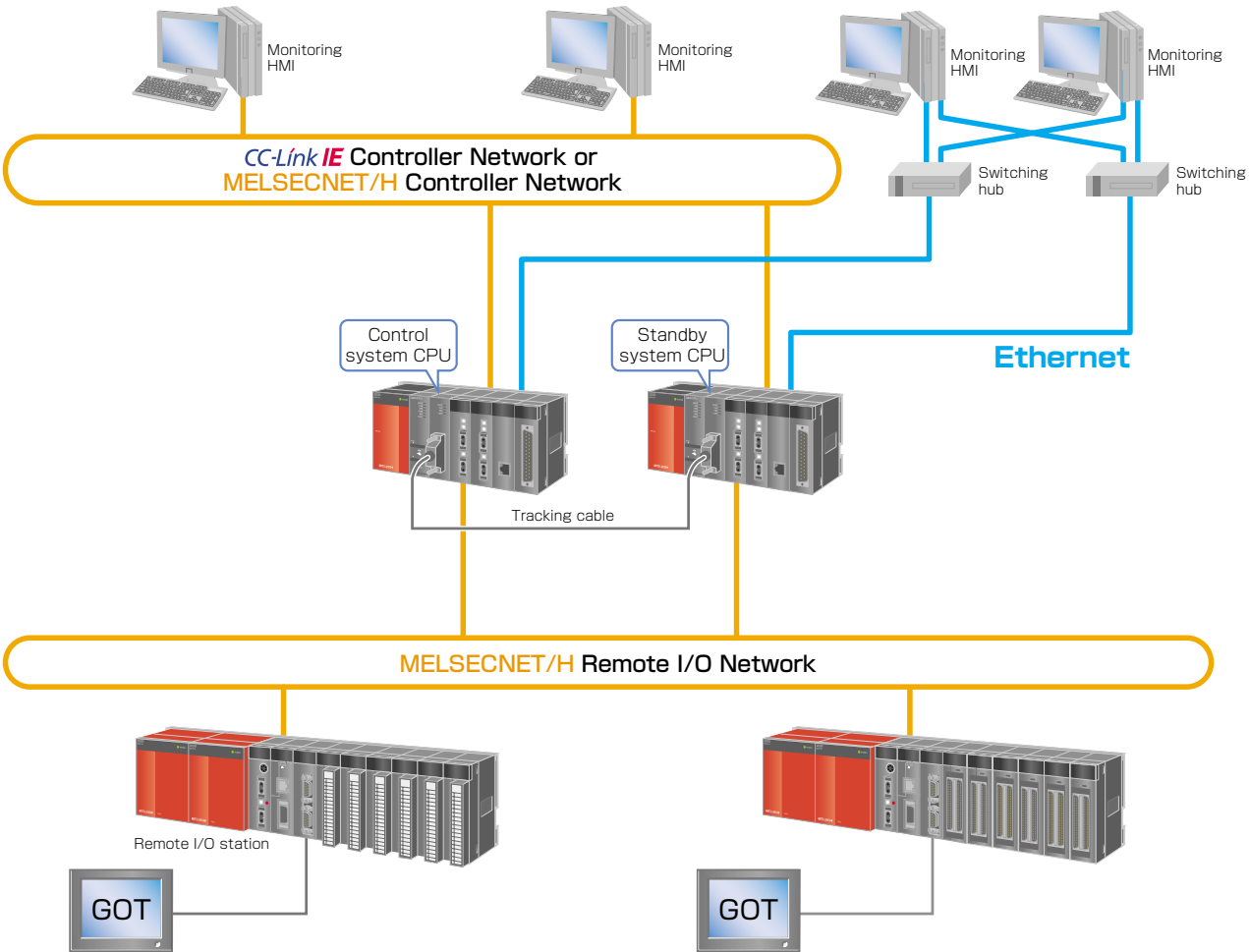The CPU directly accesses I/O modules. Ideal for systems requiring high-speed response.

Monitoring HMI
Monitoring HMI
Monitoring HMI
Monitoring HMI

CC-Link IE Controller Network or
MELSECNET/H Controller Network

Switching hub
Switching hub

Ethernet

Control system CPU
Standby system CPU

Tracking cable

Extension cable

Redundant type extension base unit

Extension cable

GOT

Redundant power extension base unit

System switching time (Reference)

Approx. 50 ms
(I/O response without going through MELSECNET/H remote I/O network)

·Tracking data reflecting time by standby system CPU

·CPU switching time: Min. 32 ms (signal flow without tracking)

Redundant remote I/O system

Ideal for distributed systems with multiple remote I/O stations.

Monitoring HMI
Monitoring HMI
Monitoring HMI
Monitoring HMI

CC-Link IE Controller Network or
MELSECNET/H Controller Network

Switching hub
Switching hub

Control system CPU
Standby system CPU

Ethernet

Tracking cable

MELSECNET/H Remote I/O Network

Remote I/O station

GOT
GOT

System switching time (Reference)

Approx. 800 ms
(I/O response via MELSECNET/H remote I/O network)

·Tracking data reflecting time by standby system CPU

·Output holding time of remote I/O station at system switching: 700 to 800 ms

·CPU switching time: Min. 21 ms (signal flow without tracking)

Redundant CPU

Features

1 Basic system/network with redundaucy
· The basic system, including the CPU module, power supply module, base unit, and network module, can be configured with redundancy.
· Networks can be configured with redundancy. When the network module fails or cable disconnection is detected, the standby system continues control and communications.

2 Improved reliability and maintainability
· With the redundancy of the basic system, the standby system takes over the control to continue the system operation when the control system fails. (Hot standby)
· By replacing the failed module or entire system, the redundant system can be recovered quickly.
· When an I/O, analog I/O, temperature input, temperature control, or channel isolated pulse input module on the redundant extension base unit or remote I/O station fails, it can be replaced without stopping or turning off the CPU. (Note 1, 2) (Operation on GX Developer is required.)
· When the CPU module is replaced while the system is operating, the parameters and programs can be copied to the new CPU by transfer instruction from GX Developer.

3 Loop control and sequence control in one CPU
· A single CPU can execute multiple programs, realizing simultaneous operation of loop control and sequence control at high speed.

4 Simple engineering
· GX Developer offers simple engineering environment for redundant system settings with the original operability.
· PX Developer facilitates creating loop control programs using FBD language.
· Writing parameters and programs is simple using GX Developer regardless of the system status (control/standby).

5 Employs existing Q Series modules
· The Q Series modules, such as I/O, intelligent function, and network modules, can be used without any changes. (Note 3)

6 Improved total system throughput
· The process CPU modules support high-speed, high-capacity network, CC-Link IE Controller Network, to allow high-speed communication with FA systems. This can shorten operation cycle and improve productivity.

Note 1) The following modules on the extension base unit or remote I/O station can be replaced while online.

Product name	Restrictions	Product name	Restrictions
Input module	No restrictions	Analog output module	Version C
Output module		Temperature input module	
I/O composite module		Temperature control module	
Analog input module	Version C	Channel isolated pulse input module	

Note 2) When the redundant type extension base unit is used, I/O modules on the main base unit cannot be replaced while online.
Note 3) Use the following serial No. or version for the redundant system.

Product name	Model	Serial No. or Version
Redundant CPU	Q12PRHCPU	First five digits of the serial number are 09012 or later (when the redundant type extension base unit is used); First five digits of the serial number are 10042 or later (when the CC-Link IE Controller Network module is used)
	Q25PRHCPU	
CC-Link IE Controller Network module	QJ71GP21-SX	No restrictions
	QJ71GP21S-SX	
MELSECNET/H master module	QJ71LP21-25	Version D or later
	QJ71LP21S-25	
	QJ71LP21G	
	QJ71BR11	
MELSECNET/H remote I/O module	QJ72LP25-25	
	QJ72LP25G	
	QJ72BR15	
Ethernet interface module	QJ71E71-B2	
	QJ71E71-B5	
	QJ71E71-100	
MELSECNET/H interface board	Q81BD-J71LP21-25	
	Q80BD-J71LP21-25	
	Q80BD-J71LP21S-25	
	Q80BD-J71LP21G	
	Q80BD-J71BR11	
CC-Link interface module	QJ61BT11N	First five digits of the serial number are 06052 or later (when it is mounted on the main base unit)
MES interface module	QJ71MES96	First five digits of the serial number are 09012 or later
Web server module	QJ71WS96	

The following functions are not available for the module mounted on the extension base unit.
· Intelligent function module dedicated instructions
· Interrupt pointer

Secifications

Item			Q12PRHCPU	Q25PRHCPU
Control method			Sequence program control method	
I/O control mode			Refresh	
Program language		Sequence control language	Ladder, list, ST, SFC	
		Process control language	Process control FBD (Note 1)	
Processing speed	Sequence instruction (Note 2)	LD instruction	34 ns	
		MOV instruction	102 ns	
		Floating point addition	782 ns	
	Process instruction (loop process time)	2 degree of freedom PID	400 µs	
		Basic PID	350 µs	
	Redundant function	Tracking execution time (extended scan time)	48 k word device memory: 10 ms 100 k word device memory: 15 ms	
Program capacity		Number of steps	124 k steps	252 k steps
		Number of programs	124	252 (Note 3)
Built-in memory		Standard RAM	256 k bytes	
		Standard ROM	496 k bytes	1008 k bytes
Loop control specifications		Process control instructions	52	
		Control cycle	10 ms or more/control loop (setting available per loop)	
		Main functions	2 degree of freedom PID control, cascade control, auto-tuning function, feed forward control	
Number of I/O device points (Note 4)			8192 points	
Number of I/O points (Note 5)			4096 points	
Internal relay [M]			8192 points	
Latch relay [L]			8192 points	
Link relay [B]			8192 points	
Timer [T]			2048 points	
Retentive timer [ST]	(Note 6)		0 points	
Counter [C]			1024 points	
Data register [D]			12288 points	
Link register [W]			8192 points	
Annunciator [F]			2048 points	
Edge relay [V]			2048 points	
File register	[R]	Standard RAM	Max. 131072 points can be used by block switching in units of 32768 points (R0 to 32767)	
		SRAM card (1 MB)	Max. 517120 points can be used by block switching in units of 32768 points (R0 to 32767)	
		SRAM card (2 MB)	Max. 1041408 points can be used by block switching in units of 32768 points (R0 to 32767)	
		Flash card (2 MB)	Max. 1041408 points can be used by block switching in units of 32768 points (R0 to 32767)	
		Flash card (4 MB)	Max. 1042432 points can be used by block switching in units of 32768 points (R0 to 32767)	
	[ZR]	Standard RAM	131072 points (R0 to 131071), block switching not required	
		SRAM card (1 MB)	517120 points (R0 to 517119), block switching not required	
		SRAM card (2 MB)	1041408 points (R0 to 1041407), block switching not required	
		Flash card (2 MB)	1041408 points (R0 to 1041407), block switching not required	
		Flash card (4 MB)	1042432 points (R0 to 1042431), block switching not required	
Link special relay [SB]			2048 points	
Link special register [SW]			2048 points	
Step relay [S]			8192 points	
Index register [Z]			16 points	
Pointer [P]			4096 points	
Interrupt pointer [I]			256 points	
Special relay [SM]			2048 points	
Special register [SD]			2048 points	
Function input [FX]			16 points	
Function output [FY]			16 points	
Function register [FD]			5 points	
Number of device tracking words			Max. 102400 points	
Number of mountable CPU modules			1 (multiple CPU system not available)	
Number of mountable modules			Max. 63	
Number of extension base stages			Max. 7	
Number of remote I/O points			8192 points (max. 2048 points/station)	

Note 1) PX Developer is required for programming by FBD.
Note 2) The processing time is the same even when the device is indexed.
Note 3) Up to 124 programs can be executed.
Note 4) Indicates the total number of I/O points on the main base unit and extension base units directly controlled by the CPU module and the number of I/O points controlled as remote I/O via the remote I/O network.
Note 5) Indicates the number of I/O points on the main base unit and extension base units directly controlled by the CPU module.
Note 6) Indicates the number of points in the defalut state. This can be changed with the prameters.

Software packages

PX Developer is used together with GX Developer.
The following version or later is required for programming the redundant CPU.

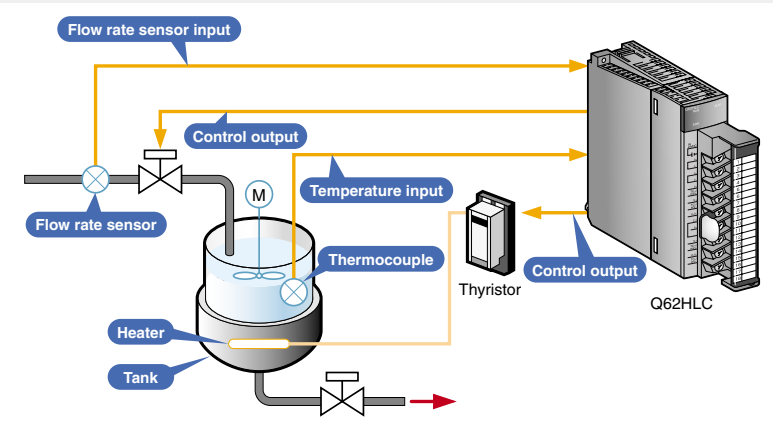| Product name	w/ CC-Link IE connection	w/o CC-Link IE connection	
		Redundant type extension base unit used	Redundant type extension base unit not used
GX Developer	Version 8.68W or later	Version 8.45X or later	Version 8.18U or later
PX Developer	Version 1.18U or later	Version 1.14Q or later	Version 1.06G or later

Loop control module

Ideal for fast response control (Note 1)

Note 1)
· Rapid temperature increase control in flip chip bond IC manufacturing
· Drying oven cooling temperature control on freeze drying machines

● Staggering 25 ms sampling and control update time, industry's fastest.
● Supports sensor types, such as thermocouple, microvoltage, and current input ranges.
● Continuous PID control by 4 to 20 mA current output results in highly stable and accurate control.

Flow rate sensor input
Control output
Temperature input
Flow rate sensor
Thermocouple
Heater
Tank
Thyristor
Control output
Q62HLC

Features

1 High-speed PID control

The Q62HLC loop control module performes a continuous PID control and supports thermocouple inputs, microvoltage inputs, voltage inputs, current inputs, and current outputs. These features make the Q62HLC ideal for fast response control.

2 Connectable to thermocouples complying with major international standards

Thermocouples complying with the JIS, IEC, NBS, and ASTM standards are supported.

Items complying with any of these can be used

JIS Standard	IEC Standard	NBS Standard	ASTM Standard
R, K, J, S, B, E, T	R, K, J, S, B, E, T, N	PL Ⅱ	W5Re, W26Re

3 Supports a variety of input ranges

The use of an input sensor (microvoltage, voltage, and current inputs) enables analog value measurements in the ranges shown below.

Microvoltage
0 to 10 mV
0 to 100 mV
-10 to 10 mV
-100 to 100 mV

Voltage
0 to 1 V
1 to 5 V
0 to 5 V
-1 to 1 V
-5 to 5 V
-10 to 10 V

Current
4 to 20 mA
0 to 20 mA

CH1
CH2
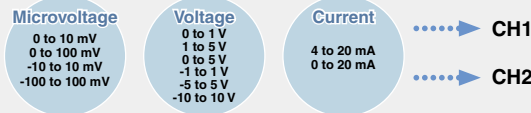
4 Program control function

Control program profiles can be specified where set values (SV) and PID constants (Proportional band, Integral time, Derivative time) are automatically changed at specified times.

Q62HLC

SV   Program control using 16-segment program profile
Time
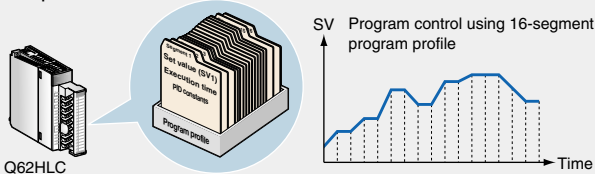
5 Cascade control function

Cascade control can be performed with channel 1 as the master and channel 2 as the slave.

Resin nozzle temperature control

Control output
Slave (CH2)
Master (CH1)
Thyristor
Heater
Extruder
Thermocouple
Thermocouple
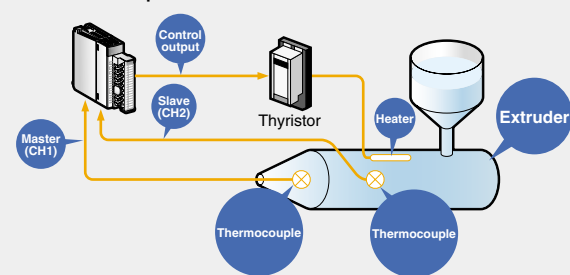
Specifications

Item		Specifications	
Number of analog I/O points		2 channels/module	
Analog input specifications		Analog output specifications	
Number of input points	2 points (2 channels)	Number of output points	2 points (2 channels)
Analog input	See (2)	Digital input	16-bit signed binary
Digital output	16-bit signed binary	Analog output	Current
Usable thermocouples	K, J, T, S, R, N, E, B, PL II, W5Re/W26Re	–	–
Input characteristics	See (1)	Output characteristics	Digital input value: 0 to 1000 (0 to 4000 when using simplified analog output) Output range: 4 to 20 mA
Maximum resolution	See (1)	Maximum resolution	4 μA
Accuracy (Note 2) Indication accuracy	Ambient temperature: 23℃ ± 2℃	See (2) (a)	Indication accuracy Ambient temperature: 23℃ ± 2℃	Full scale x (±0.2%)
	Ambient temperature: 0℃ to 55℃	See (2) (b)	Ambient temperature: 0℃ to 55℃	Full scale x (±0.4%)
Cold junction temperature compensation accuracy	Ambient temperature: 23℃ ± 2℃	±0.5℃	–	–
	Ambient temperature: 0℃ to 55℃	±1.0℃	–	–
Conversion speed		25 ms/2channels (constant regardless of the number of channels used)	Conversion speed	25 ms/2channels (constant regardless of the number of channels used)
Sampling cycle		25 ms/2channels (constant regardless of the number of channels used)	–	–
Absolute maximum input		Microvoltage: ± 12 V, voltage: ± 15 V, current: ± 30 mA	Allowable load resistance	600 Ω or less
Input impedance		Thermocouple, microvoltage, voltage: 1 MΩ, current: 250 Ω	Output impedance	5 MΩ

Note 2) Accuracy is calculated as follows: [Accuracy] = [Indication accuracy] + [Cold junction temperature compensation accuracy]

(1) Usable input sensor types, measurement ranges, and data resolution

Input		Input range	Digital value	Resolution
Thermocouple	K	-200 to 1372°C	-2000 to 13720	0.1°C
	J	-200 to 1200°C	-2000 to 12000	
	T	-200 to 400°C	-2000 to 4000	
	S	-50 to 1768°C	-500 to 17680	
	R	-50 to 1768°C	-500 to 17680	
	N	0 to 1300°C	0 to 13000	
	E	-200 to 1000°C	-2000 to 10000	
	B	0 to 1800°C	0 to 18000	
	PL II	0 to 1390°C	0 to 13900	
	W5Re/W26Re	0 to 2300°C	0 to 23000	
Microvoltage		0 to 10 mV	0 to 20000	0.5 μV
		0 to 100 mV		5 μV
		-10 to 10 mV	-10000 to 10000	1 μV
		-100 to 100 mV		10 μV
Voltage		0 to 1 V	0 to 20000	0.05 mV
		1 to 5 V		0.2 mV
		0 to 5 V		0.25 mV
		0 to 10 V		0.5 mV
		-1 to 1 V	-10000 to 10000	0.1 mV
		-5 to 5 V		0.5 mV
		-10 to 10 V		1 mV
Current		4 to 20 mA	0 to 20000	0.8 μA
		0 to 20 mA		1 μA

(2) Indication accuracy

(a) At ambient temperature of 23 ± 2°C

Item		Error	
Thermocouple	K, J, T, E, PL II	Less than -100°C	± 1.0°C
		-100 to less than 500°C	± 0.5°C
		500°C or more	± [Indication value x (0.1%) + 1 digit]
	S, R, N, W5Re/W26Re	-50 to less than 1000°C	± 1.0°C
		1000°C or more	± [Indication value x (0.1%) + 1 digit]
	B	Less than 400°C	± 70.0°C
		400 to less than 1000°C	± 1.0°C
		1000°C or more	± [Indication value x (0.1%) + 1 digit]
Microvoltage		Full scale x (±0.1%)	
Voltage			
Current			

(b) At ambient temperature of 0 to 55°C

| Item		Error	
Thermocouple	K, J, T, E, PL II	Less than -100°C	± 2.0°C
		-100 to less than 500°C	± 1.0°C
		500°C or more	± [Indication value x (0.2%) + 1 digit]
	S, R, N, W5Re/W26Re	-50 to less than 1000°C	± 2.0°C
		1000°C or more	± [Indication value x (0.2%) + 1 digit]
	B	Less than 400°C	± 140.0°C
		400 to less than 1000°C	± 2.0°C
		1000°C or more	± [Indication value x (0.2%) + 1 digit]
Microvoltage		Full scale x (±0.2%)	
Voltage			
Current			

Redundant power supply system

The redundant power supply system can be configured to back up the system in the event of a power failure.

Features

Redundant power supplies supporting all CPUs

1. Even if one power supply module fails, the other one supplies the power to the system.
2. A failed power supply module can be confirmed by a "power failure detection function" or "LED indicators", allowing for quick replacement. This ensures system backup.
3. The power supply module can be replaced while online.
4. Q64RP (AC input) and Q63RP (DC input) can be used together. Creating two power supply systems (AC and DC) further enhances system reliability.

Power supply slot 1*   Power supply slot 2*

Q64RP or Q63RP   Q64RP or Q63RP
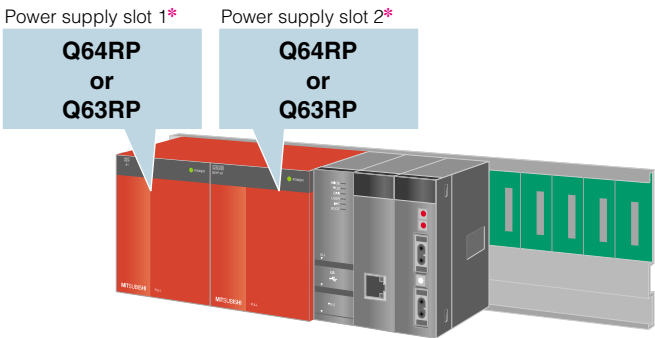
* Either Q64RP or Q63RP can be mounted on the power supply slot 1 and 2.
Also, in the event of a power failure, the power supply module can be replaced while online.

Specifications

Item		Q64RP	Q63RP
Applicable base unit		Q38RB, Q68RB, Q65WRB	
Input power supply		100 to 120 V AC/200 to 240 V AC (+10%, -15%) (85 to 132 V AC/170 to 264 V AC)	24 V DC (+30%, -35%) (15.6 to 31.2 V DC)
Input frequency		50/60 Hz ±5%	N/A
Input voltage distortion rate		Within 5%	N/A
Maximum input apparent power		160 VA	N/A
Maximum input power		N/A	65 W
Inrush current		20 A, 8 ms or less	150 A, 1 ms or less
Rated output current		8.5 A	
Overcurrent protection		9.35 A or more	
Overvoltage protection		5.5 to 6.5 V	
Efficiency		65% or more	
Allowable momentary power failure period		20 ms or less	10 ms or less (at 24 V DC input)
Contact output	Application	ERR contact	
	Rated switching voltage/current	24 V DC/0.5 A	
	Minimum switching load	5 V DC, 1 mA	
	Response time	OFF to ON: 10 ms or less, ON to OFF: 12 ms or less	
	Life	Mechanical: 20,000,000 times or more Electrical: 100,000 times or more at rated switching voltage and current	
	Surge suppressor	No	
	Fuse	No	

Fiber optic loop network module with external power supply function

The external power supply function enables the system to continue data link when the power supply module fails.

Features

External power supply prevents the system from being affected by a power failure

Even if a power failure occurs at more than two stations in a loop system, a station in between can continue data link. This function also prevents loopback in the system. The link scan time can be stabilized, ensuring steady system operation.

When a power failure occurred in two stations:

Without external power supply function

Control station (Station 1)   Normal station (Station 2)   Normal station (Station 3)

Power failure

Loopback

CC-Link IE Controller Network or MELSECNET/H Controller Network

Loopback

Disconnected because it is located between two failed stations.

Control station (Station 6)   Normal station (Station 5)   Normal station (Station 4)

Power failure   Power failure   Normal but disconnected

With external power supply function

Control station (Station 1)   Normal station (Station 2)   Normal station (Station 3)

External power supply 24 V   External power supply 24 V   External power supply 24 V

Power failure

CC-Link IE Controller Network or MELSECNET/H Controller Network

External power supply 24 V   External power supply 24 V   External power supply 24 V

Control station (Station 6)   Normal station (Station 5)   Normal station (Station 4)

Power failure   Power failure   Not disconnected from network

Specifications

| Item		CC-Link IE Controller Network module QJ71GP21S-SX	MELSECNET/H module QJ71LP21S-25
External power supply	Voltage	20.4 to 31.2 V DC	
	Current	0.28A	0.20A
	Terminal screw size	M3	
	Applicable crimping terminal	R1.25-3	
	Applicable wire size	0.3 to 1.25 mm^2	
	Tightening torque	0.42 to 0.58 N·m	
	Allowable momentary power failure time	1 ms (Level PS1)	
	Noise immunity	By noise simulator of 500Vp-p noise voltage, 1 μs pulse width, and 25 to 60Hz noise frequency	

Channel isolated analog modules

A wide selection of channel isolated analog modules are provided to meet requirements for process control and high-accuracy control.
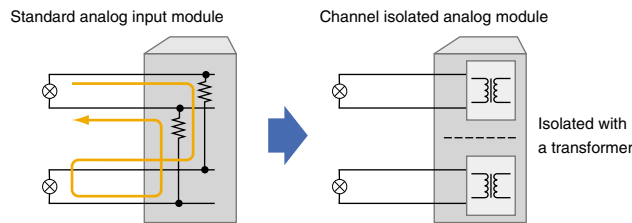
Features

High dielectric withstand voltage
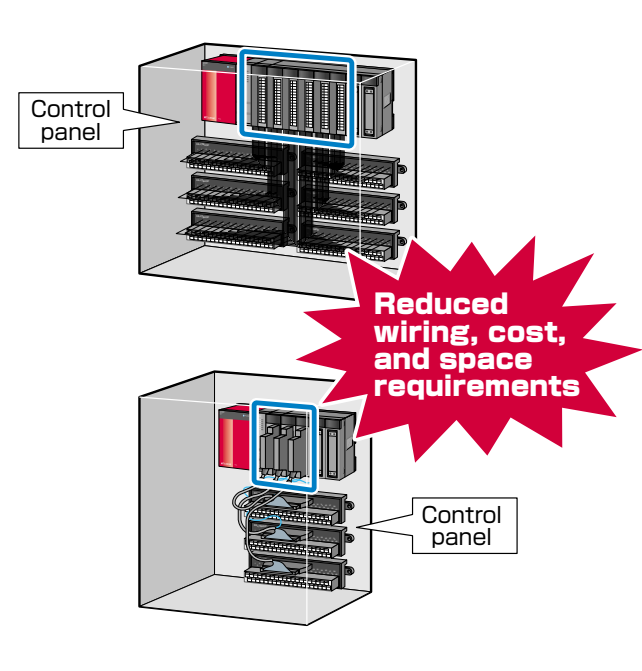
External signal converters are not required.
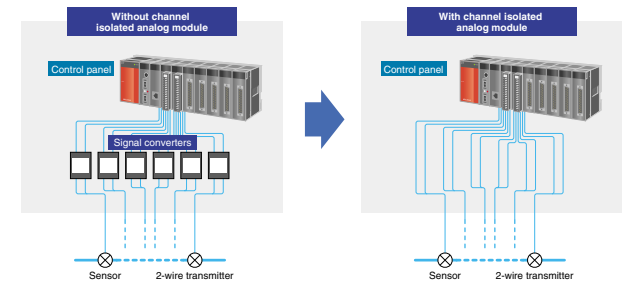
Electric disturbances such as current and noise can be isolated.

Cost and space requirement reduction (multi-channel type)

With multi-channel modules, more cost effective and small footprint systems can be configured.

Disconnection detection function

When the analog output range is 4 to 20 mA or the user range setting of current, disconnection is detected by monitoring output values.

Warning and error detection functions

Analog modules monitor analog input signals and notify warnings and errors.
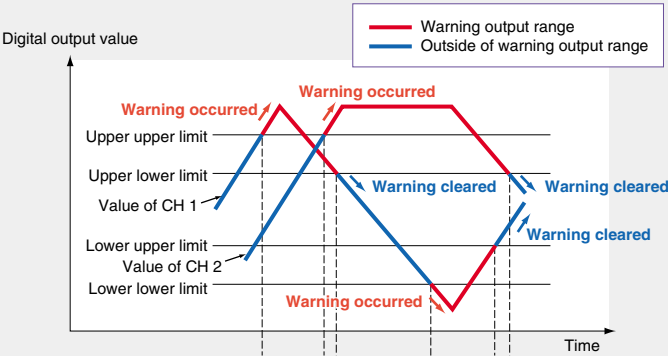
Online module change (hot swap)

Even if the analog module fails during operation, it can be replaced without stopping the system.
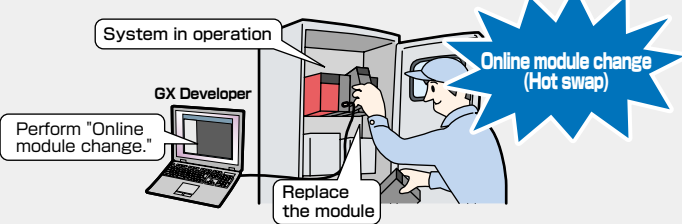
Scaling function (Q68AD-G, Q66AD-DG, Q66DA-G, Q68TD-G-H01)

A value input from an external device can be converted to an arbitrary value. This function eliminates the need for a ladder program that converts A/D conversion data to an actual physical value.
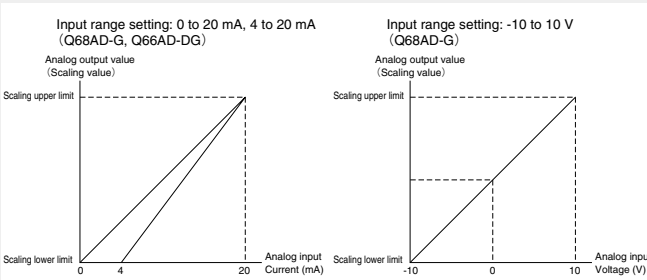
Specifications

Channel isolated high resolution analog input module

Item		Q64AD-GH
No. of analog input points		4 points (4 channels)
Analog input	Voltage	0 to 5 V DC, 1 to 5 V DC, 0 to 10 V DC, -10 to 10 V DC, user range
	Current	0 to 20 mA DC, 4 to 20 mA DC, user range
Absolute max. input		$\pm$15 V, $\pm$30 mA
Digital output	32-bit	0 to 64000 (0 to 5 V DC, 1 to 5 V DC, 0 to 10 V DC; 0 to 20 mA DC, 4 to 20 mA DC) -64000 to 64000 (-10 to 10 V DC)
	16-bit	0 to 32000 (0 to 5 V DC, 1 to 5 V DC, 0 to 10 V DC; 0 to 20 mA DC, 4 to 20 mA DC) -32000 to 32000 (-10 to 10 V DC)
Accuracy (accuracy to max. digital output value)	Reference accuracy	$\pm$0.05% Digital output value (32-bit): $\pm$32 digits Digital output value (16-bit): $\pm$16 digits
	Temperature coefficient	$\pm$71.4 ppm/°C (0.00714%/°C)
Conversion speed		10 ms/4 channels
No. of writes to E^{2}PROM		Max. 100,000 times
Isolation method		Between I/O terminal and programmable controller power supply: Photocoupler Between analog input channels: Transformer
No. of occupied I/O points		16 points (I/O assignment: Intelligent 16 points)
External connections		18-point terminal block
Applicable wire size		0.3 to 0.75 mm^2
Applicable crimping terminal		R1.25-3 (Insulated crimping terminals cannot be used.)

Channel isolated high resolution analog input module (with signal conditioning function)

	Item		Q62AD-DGH
2-wire transmitter connection	Input specifications	No. of analog input points	2 points (2 channels)
		Analog input	4 to 20 mA DC (input resistance: 250 Ω), user range
	Power supply specifications	Supply voltage	26$\pm$2 V DC
		Max. supply current	24 mA DC
		Short-circuit protection	Yes (limit current: 25 to 35 mA)
Check terminals			Yes
Digital output		32-bit	0 to 64000
		16-bit	0 to 32000
Accuracy (accuracy to max. digital output value)		Reference accuracy	$\pm$0.05% Digital output value (32-bit): $\pm$32 digits Digital output value (16-bit): $\pm$16 digits
		Temperature coefficient	$\pm$71.4 ppm/°C (0.00714%/°C)
Conversion speed			10 ms/2 channels
No. of writes to E^{2}PROM			Max. 100,000 times
Isolation method			Between I/O terminal and programmable controller power supply: Photocoupler Between analog input channels: Transformer Between external power supply and analog input channel: Transformer
No. of occupied I/O points			16 points (I/O assignment: Intelligent 16 points)
External connections			18-point terminal block
Applicable wire size			0.3 to 0.75 mm^2
Applicable crimping terminal			R1.25-3 (Insulated crimping terminals cannot be used.)

Channel isolated analog input module

Item		Q68AD-G
No. of analog input points		8 points (8 channels)
Analog input	Voltage	0 to 5 V DC, 1 to 5 V DC, 0 to 10 V DC, -10 to 10 V DC, user range
	Current	0 to 20 mA DC, 4 to 20 mA DC, user range
Absolute max. input		$\pm$15 V, $\pm$30 mA
Digital output	High resolution mode	0 to 16000 (0 to 10 V DC), 0 to 12000 (0 to 5 V DC, 1 to 5 V DC; 0 to 20 mA DC, 4 to 20 mA DC), -16000 to 16000 (-10 to 10 V DC), -12000 to 12000 (user range)
	Normal resolution mode	0 to 4000 (0 to 10 V DC, 0 to 5 V DC, 1 to 5 V DC; 0 to 20 mA DC, 4 to 20 mA DC) -4000 to 4000 (-10 to 10 V DC, user range)
Accuracy (accuracy to max. digital output value)	Reference accuracy	$\pm$0.1% High resolution mode (0 to 10 V, -10 to 10 V): $\pm$16 digits High resolution mode (other than the above ranges): $\pm$12 digits Normal resolution mode: $\pm$4 digits
	Temperature coefficient	$\pm$71.4 ppm/°C (0.00714%/°C)
Sampling cycle		10 ms/channel
No. of writes to flash memory		Max. 50,000 times
Isolation method		Transformer
No. of occupied I/O points		16 points (I/O assignment: Intelligent 16 points)
External connections		40-pin connector
Applicable wire size		0.3 mm^2 (22 AWG) or less
Applicable connector		A6CON4 (sold separately)

Channel isolated analog input module (with signal conditioning function)

	Item		Q66AD-DG
2-wire transmitter connection	Input specifications	No. of analog input points (no. of 2-wire transmitters)	6 points (6 channels)
		Analog input	4 to 20 mA DC (input resistance: 250 Ω), user range (0 to 20 mA DC without 2-wire transmitter)
	Power supply specifications	Supply voltage	26$\pm$2 V DC
		Max. supply current	24 mA DC
		Short-circuit protection	Yes (limit current: 25 to 35 mA)
Check terminals			Yes
Digital output		High resolution mode	0 to 12000
		Normal resolution mode	0 to 4000
Accuracy (accuracy to max. digital output value)		Reference accuracy	$\pm$0.1% High resolution mode: $\pm$12 digits Normal resolution mode: $\pm$4 digits
		Temperature coefficient	$\pm$71.4 ppm/°C (0.00714%/°C)
Sampling cycle			10 ms/channel
No. of writes to flash memory			Max. 50,000 times
Isolation method			Transformer
No. of occupied I/O points			16 points (I/O assignment: Intelligent 16 points)
External connections			40-pin connector
Applicable wire size			0.3 mm^2 (22 AWG) or less
Applicable connector			A6CON4 (sold separately)

🔷 Specifications

Channel isolated analog output module

Item		Q62DA-FG
No. of analog output points		2 points (2 channels)
Digital input		16-bit signed binary (-12288 to 12287, -16384 to 16383)
Analog output	Voltage	-12 to 12 V DC (external load resistance: 1 k to 1 MΩ)
	Current	0 to 20 mA DC (external load resistance: 0 to 600 Ω)
Analog output range	Voltage	1 to 5 V DC, 0 to 5 V DC, -10 to 10 V DC, user range setting 2, user range setting 3
	Current	0 to 20 mA DC, 4 to 20 mA DC, user range setting 1
Accuracy (accuracy to max. analog output value)	Reference accuracy	±0.1% (voltage: ±10 mV, current: ±20 μA)
	Temperature coefficient	±80 ppm/°C (0.008%/°C)
Conversion speed		10 ms/2 channels
Absolute max. output	Voltage	±13 V
	Current	23 mA
Output monitor	Resolution	12 bits
	Reference accuracy	±0.2%
	Temperature coefficient	±160 ppm/°C (0.016%/°C)
No. of writes to E²PROM		Max. 100,000 times
Short-circuit protection		Yes
Isolation method		Between I/O terminal and programmable controller power supply: Photocoupler Between analog output channels: Transformer Between external power supply and analog output channel: Transformer
No. of occupied I/O points		16 points (I/O assignment: Intelligent 16 points)
External connections		18-point terminal block
Applicable wire size		0.3 to 0.75 mm²
Applicable crimping terminal		R1.25-3 (Insulated crimping terminals cannot be used.)

Item		Q66DA-G
No. of analog output points		6 points (6 channels)
Digital input		16-bit signed binary (high resolution mode: -12288 to 12287, -16384 to 16383; normal resolution mode: -4096 to 4095)
Analog output	Voltage	-12 to 12 V DC (external load resistance: 1 k to 1 MΩ)
	Current	0 to 20 mA DC (external load resistance: 0 to 600 Ω)
Analog output range	Voltage	1 to 5 V DC, 0 to 5 V DC, -10 to 10 V DC, user range setting 2, user range setting 3
	Current	0 to 20 mA DC, 4 to 20 mA DC, user range setting 1
Accuracy (accuracy to max. analog output value)	Reference accuracy	±0.1% (voltage: ±10 mV, current: ±20 μA)
	Temperature coefficient	±80 ppm/°C (0.008%/°C)
Conversion speed		6 ms/channel
Absolute max. output	Voltage	±13 V
	Current	23 mA
No. of writes to flash memory		Max. 50,000 times
Short-circuit protection		Yes
Isolation method		Between output terminal and programmable controller power supply: Transformer Between analog output channels: Transformer Between external power supply and analog output channel: Transformer
No. of occupied I/O points		16 points (I/O assignment: Intelligent 16 points)
External connections		40-pin connector
Applicable wire size		0.3 mm² (22 AWG) or less
Applicable connector		A6CON4 (sold separately)

Channel isolated thermocouple/micro voltage input module and thermocouple input module

Item		Q64TDV-GH	Q64TD	Q68TD-G-H01
No. of channels		4 channels		8 channels
Output	Temperature conversion value	16-bit signed binary (-2700 to 18200: Each increment represents 0.1°C change)		
	Scaling value	16-bit signed binary		
Thermocouple standards		JIS C1602-1995		JIS C1602-1995, IEC 60584-1 (1995), IEC 60584-2 (1982)
Usable thermocouples and temperature measurement range		B: 0 to 1820°C, R: -50 to 1760°C, S: -50 to 1760°C, K: -270 to 1370°C, E: -270 to 1000°C, J: -210 to 1200°C, T: -270 to 400°C, N: -270 to 1300°C		
Micro voltage input range		-100 to 100 mV (input resistance: 2 MΩ or more)	N/A	
Cold junction temperature compensation accuracy		±1.0°C		
Conversion speed		Sampling cycle x 3	40 ms/channel	320 ms/8 channels
Sampling cycle		20 ms/channel	N/A	
No. of analog input points		(4 channels + Pt100 connection channel)/module		(8 channels + Pt100 connection channel)/module
Isolation method		Between thermocouple input/micro voltage input and ground: Transformer Between thermocouple input/micro voltage input channels: Transformer Between cold junction temperature compensation input (Pt100) and ground: Non-isolated		
Disconnection detection		Yes (each channel independently)		No
No. of writes to E²PROM		Max. 100,000 times		N/A
No. of writes to frash memory		N/A		Max. 50,000 times
No. of occupied I/O points		16 points (I/O assignment: Intelligent 16 points)		
External connections		18-point terminal block		40-pin connector
Applicable wire size		0.3 to 0.75 mm²		0.3 mm² (22 AWG) or less
Applicable crimping terminals		1.25-3, R1.25-3 (Insulated crimping terminals cannot be used.)		N/A
Applicable connector		N/A		A6CON4 (sold separately)

Channel isolated RTD input module

Item			Q64RD-G	Q68RD3-G NEW
No. of channels			4 channels	8 channels
Output	Temperature conversion value		16-bit signed binary (-2000 to 8500: Each increment represents 0.1°C change), 32-bit signed binary (-200000 to 850000: Each increment represents 0.001°C change)	16-bit signed binary (-2000 to 8500: Each increment represents 0.1°C change)
	Scaling value		16-bit signed binary	
Measuring method (wire type)			3-/4-wire type	3-wire type
Usable RTD			Pt100 (JIS C1604-1997, IEC 751 1983) Temperature measurement range: -200 to 850°C	
			JPt100 (JIS C1604-1981) Temperature measurement range: -180 to 600°C	
			Ni100 (DIN43760 1987) Temperature measurement range: -60 to 180°C	
Accuracy	Pt100	-200 to 850°C	±0.553°C (25±5°C), ±1.615°C (0 to 55°C)	±0.8°C (25±5°C), ±2.4°C (0 to 55°C)
		-20 to 120°C	±0.090°C (25±5°C), ±0.300°C (0 to 55°C)	±0.3°C (25±5°C), ±1.1°C (0 to 55°C)
		0 to 200°C	±0.145°C (25±5°C), ±0.470°C (0 to 55°C)	±0.4°C (25±5°C), ±1.2°C (0 to 55°C)
	JPt100	-180 to 600°C	±0.390°C (25±5°C), ±1.140°C (0 to 55°C)	±0.8°C (25±5°C), ±2.4°C (0 to 55°C)
		-20 to 120°C	±0.090°C (25±5°C), ±0.300°C (0 to 55°C)	±0.3°C (25±5°C), ±1.1°C (0 to 55°C)
		0 to 200°C	±0.145°C (25±5°C), ±0.470°C (0 to 55°C)	±0.4°C (25±5°C), ±1.2°C (0 to 55°C)
	Ni100	-60 to 180°C	±0.135°C (25±5°C), ±0.450°C (0 to 55°C)	±0.4°C (25±5°C), ±1.2°C (0 to 55°C)
Resolution			0.025°C	0.1°C
Conversion speed			40 ms/channel	320 ms/8 channels
No. of analog input points			4 channels/module	8 channels/module
Isolation method			Between RTD input and programmable controller power supply: Photocoupler Between RTD input channels: Transformer	Between RTD input and programmable controller power supply: Transformer Between RTD input channels: Transformer
Disconnection detection			Yes (each channel independently)	
No. of writes to E²PROM			Max. 100,000 times	N/A
No. of writes to frash memory			N/A	Max. 50,000 times
No. of occupied I/O points			16 points (I/O assignment: Intelligent 16 points)	
External connections			18-point terminal block	40-pin connector
Applicable wire size			0.3 to 0.75 mm²	0.3 mm² (22 AWG) or less
Applicable crimping terminals			1.25-3, R1.25-3 (Insulated crimping terminals cannot be used.)	N/A
Applicable connector			N/A	A6CON4 (sold separately)

Channel isolated pulse input module

Item			QD60P8-G
Counting speed switch settings			30 kpps/10 kpps/1 kpps/100 pps/50 pps/10 pps/1 pps/0.1 pps
No. of channels			8 channels
Count input signal	Phase		1 phase
	Signal level		5 V DC/12 to 24 V DC
Counter	Counting speed (max.)		30 kpps/10 kpps/1 kpps/100 pps/50 pps/10 pps/1 pps/0.1 pps
	Counting range		Sampling pulse number: 16-bit binary (0 to 32767) Accumulating count value: 32-bit binary (0 to 99999999) Input pulse value: 32-bit binary (0 to 2147483647)
	Count type		Linear counter method, ring counter method
No. of occupied I/O points			32 points (I/O assignment: Intelligent 32 points)
External connections			18-point terminal block
Applicable wire size			0.3 to 0.75 mm²
Applicable crimping terminals			R1.25-3 (Insulated crimping terminals cannot be used.)

Temperature control module

Item	Q64TCTT	Q64TCTTBW	Q64TCRT	Q64TCRTBW
Control output	Transistor output			
No. of temperature input point	4 channels/module			
Usable thermocouples/platinum RTDs	Thermocouple (R, K, J, T, S, B, E, N, U, L, PL II, W5Re/W26Re)		Platinum RTD (Pt100, JPt100)	
Accuracy	Ambient temperature of 25±5°C: Full scale x (±0.3%) Ambient temperature of 0 to 55°C: Full scale x (±0.7%)			
Sampling cycle	0.5 s/4 channels			
PID constant range	Proportional band (P): 0.0 to 1000.0% Integral time (I): 1 to 3600 s Derivative time (D): 0 to 3600 s			
Isolation method	Between input and ground: Transformer Between input and channel: Transformer			
Heater disconnection detection	No	Yes	No	Yes
No. of occupied I/O points	16 points (I/O assignment: Intelligent 16 points)	32 points/2 slots (Default I/O assignment: Empty 16 points [first half], Intelligent 16 points [second half])	16 points (I/O assignment: Intelligent 16 points)	32 points/2 slots (Default I/O assignment: Empty 16 points [first half], Intelligent 16 points [second half])
External connections	18-point terminal block	Two 18-point terminal blocks	18-point terminal block	Two 18-point terminal blocks
Applicable wire size	0.3 to 0.75 mm²			
Applicable crimping terminals	R1.25-3, 1.25-YS3, RAV1.25-3, V1.25-YS3A			

PX Developer

PX Developer screen configuration and screen examples

Programming tool

Screen configuration
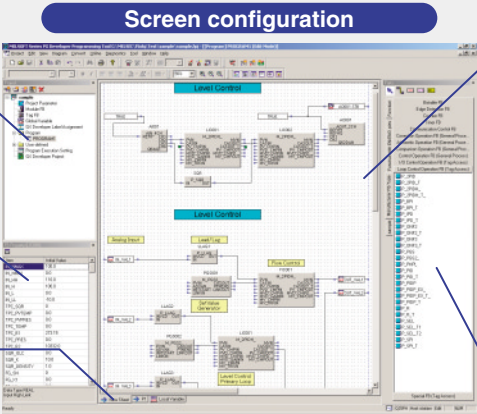

Project window
The project parameters, applicable modules, tags, program names, execution cycle, etc. are set in this window.

FB property window
The initial values of the data in the FB are set in this window.

Sheet
Maximum 32 sheets/program

Program/FB definition window
The programs and user defined FBs are created in this window.

A program is a unit in which the process is described. Up to 200 programs can be created. One program contains up to 32 sheets. A sheet is a form used to paste FB/functions or connector lines and to describe the process. The program execution method, such as the execution cycle, can be set in this window.

FB/function part window
The FB/function parts which can be pasted to the programs and user defined FBs are displayed in this window.

Monitor tool

Screen configuration

Monitor function display area
Each monitor function (control panel, trend graph, faceplate, tuning panel, alarm list, or event list) is displayed in this area.
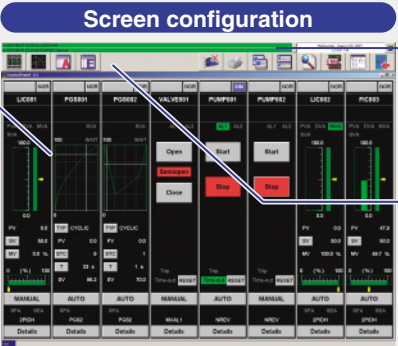
Alarm/event display area
The latest two alarms or event messages are displayed.

Tool bar
Icons that call out each monitor function are displayed.

Historical trend graph

Event/alarm list

Process control monitoring screen generator

The PX Developer Monitor tool can generate process control monitoring screens for GOT from process control programs created by the programming tool. Also, graphic screens can be configured by combining the following optional tools with the Monitor tool.

PX Developer Monitor tool

SoftGOT screen creation tool
GOT catalog

Graphic screens can be created inexpensively using the Soft GOT drawing tool.

MX Component with VB language
MELSOFT catalog

Highly flexible graphic screens can be created using VB language. MX Component facilitates communication with the process CPU.

Example of graphic screen creation tool

Features

1 Substantial FBs (function blocks) **and functions for loop control**
· In addition to the process CPU's loop control instruction FBs, PX Developer has combined FBs that are easy to use.
· Basic FB/functions (logical operation, arithmetic operation, etc.) that comply with IEC61131-3 are also provided, allowing simple sequence control to be described in the FBD.

2 Easy programming with FBs/process tag names
· The loop control program can be created easily. Select the required FBs from the PX Developer's standard loop control FB or compensation FB, paste and connect them on the screen, and then set the parameters such as the PID constants and upper/lower limits (items configuring tags).
· When programming with tag names, the parameters in the tag can be described as "tag name.parameter name" (FIC001.PV, etc.). This enables the user to program without having to concern about the device memory addresses.

3 Analog/digital I/O processing in FB
· FBs for I/O processing of the analog and I/O modules controlled by the process CPU are equipped. Ladder programs for I/O processing are no longer required.

4 Easy to standardize and reuse programs
· PX Developer complies with the IEC61131-3 standards. Programs can be modularized (custom FB can be created). This allows for reuse in future projects requiring similar capabilities, greatly reducing development time.

5 Program event execution
· FBD programs can be executed not only periodically but also automatically upon event occurrence. (The event conditions can be described without a program.) PX Developer easily realizes the starting process for nonstationary, error, and exceptional processes.

6 Integration with sequence control programs
· Easy data exchange with ladder programs.
· Data can be exchanged between the FBD program and ladder program (created with GX Developer) using logical names (labels) instead of device memory addresses. Therefore, constants of loop control tags, SV values, etc. can be easily changed from the ladder programs.

7 Uploading/downloading FBD programs
· Graphic data of FBD programs can be stored in the programmable controller CPU by writing.
· The stored data can be recovered by reading from the programmable controller CPU. Therefore, the program can be edited with a PC in which the project is not stored.

8 Comprehensive tuning and monitoring functions
· The PX Developer has various screens (face plate, tuning trend, alarm, event list, etc.) used to tune, monitor, and operate the created control loop. Tuning and monitoring are available immediately after creating the program.

9 Combination with SoftGOT
· Using together with SoftGOT, process control monitoring screens can be readily created. P.33 P.38

10 Improved operability for redundant system
· Users can design the redundant system without repeating the same procedure for the control and standby systems, reducing the total setup and design time.

PX Developer

Specifications

Programming tool

Item	Specifications
Target CPU	Process CPU (Q02PHCPU/Q06PHCPU/Q12PHCPU/Q25PHCPU) Redundant CPU (Q12PRHCPU/Q25PRHCPU)
Target network	CC-Link IE Controller Network, MELSECNET/H, MELSECNET/10 (Note 1), Ethernet (10/100 Mbps), RS232 (CPU's RS-232 port), USB (CPU's USB port)
Programming languages	IEC61131-3 compliant FBD language
Number of programs	Max. 200 (max. 32 sheets/program)
Number of tags	Max. 120/process CPU (Q02/06PHCPU) Max. 480/process CPU (Q12/25PHCPU, Q12/25PRHCPU)
FB/function types	· General functions: 58 types (IEC61131-3 compliant basic functions) · General FB: 20 types (IEC61131-3 compliant basic FB) · Process functions: 5 types (corresponding to process instructions for CPU) · General process FB: 28 types (corresponding to process instructions for CPU) · Tag access FB: 37 types (corresponding to process instructions for CPU) · Tag FB: 46 types (high function FBs with temperature control function by combining process FBs) · Module FB: 31 types (FBs for accessing Q Series analog and I/O modules)
Program execution method	· Timer execution type: scan executed at high speed (200 ms cycle), normal speed (200/400/600/800 ms/1 s cycle), or low speed (1/2/4/5/10 s cycle) · Interrupt execution type: cycle interrupt (1 to 999 ms) or random interupt (interrupt with interrupt pointer I0 to I255) (in practical use, 10 ms or more/control loop)

Monitor tool

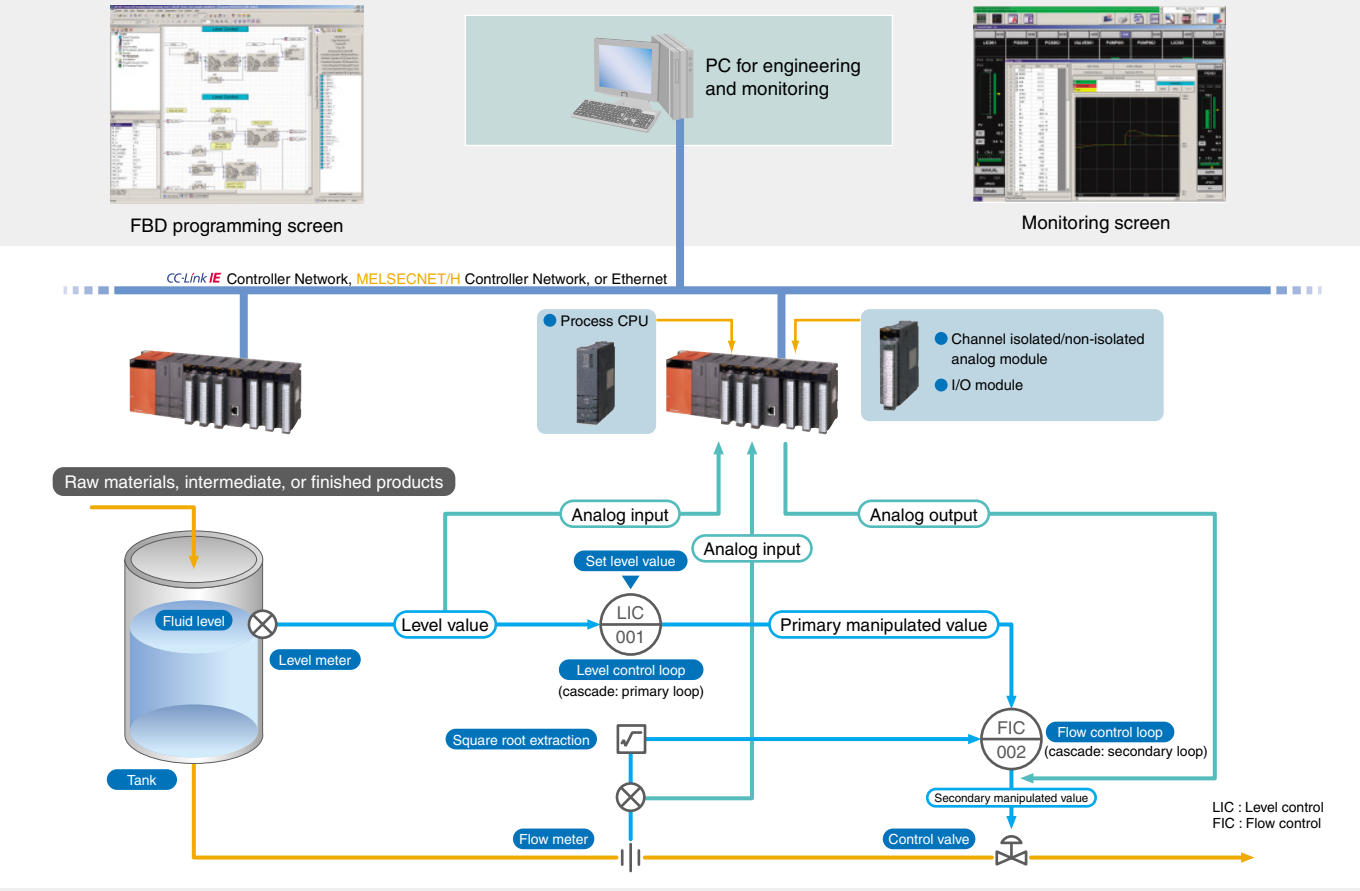|	Item	Specifications
	Target CPU and network	· Same as the programming tool
	Number of monitoring CPU modules and tags	· Number of process CPUs under monitoring: Max. 8 (Max. 8 process CPUs can be monitored from one PC.) For the redundant system, a pair of CPUs (control and standby systems) is counted as one CPU. · Number of monitor tags: Max. 3,840
Monitor functions	Control panel	· 8 faceplates/screen (one group) x max. 500 screens = 4,000 faceplates · Lockout tag available for each faceplate
	Trend graph	· 8 items/screen (one group) x max. 125 screens = 1,000 items · Collection cycle: 1 s/10 s/1 min./5 min./10 min. · The chart can be output into a CSV file.
	Alarm list	· Max. 2,000 alarms can be displayed. · The list can be output into a CSV file.
	Event list	· Max. 2,000 events can be displayed. · The list can be output into a CSV file.
	User application	· Max. 4 can be started.
	Tag data external I/F	· The faceplate can be displayed, monitored, and operated on an external application by using ActiveX faceplate button or faceplate control.
	GOT screen generator function	· Process control monitoring screens for GOT1000 can be automatically generated from process control programs created by the programming tool. (Max.120 tags) Graphic screens can also be created with InTouch.

Note 1) When An, AnS, QnA, QnAS, and Q4AR CPUs are mixed on the network, the target network is MELSECNET/10 PLC to PLC network.

Redundant system related functions (Programming tool)

Simple engineering environment
All tag information and programs are managed in a single project; programs and parameters are downloaded to both systems, just like a single system. No special consideration for redundancy is required, reducing engineering time.

No tracking setting required
Device tracking settings in PX Developer are automatically generated by compiling, reducing setup time.
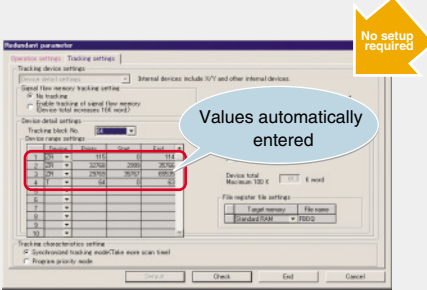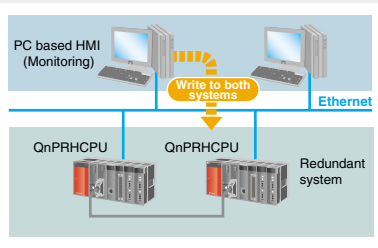
Redundant system related functions (Monitor tool)

Easy to monitor
By setting the control system as the monitoring target in the transfer setup, the new control system is automatically monitored when the system is switched. No extra setting is required for system switching.

Monitoring redundant system communication status
Both systems in the redundant system are monitored; the status of each system (control/standby) and communication errors are displayed.

Application example: Fluid level control

Application
The MELSEC process control system can be used to control fluid level at food and chemical plants. Fluid level of raw materials, intermediate products, and finished products in the tank can be maintained within the set range.

Control details
The level control loop (cascade: primary loop) inputs the tank level (analog value) and implements PI operation to achieve the set level value.
The flow control loop (cascade: secondary loop) uses the operation result (primary manipulated value) of the level control loop as the set value and implements PI operation with the flow rate from the flow meter. The result is output as an analog value to the control valve, which is the secondary manipulated value (control valve open).
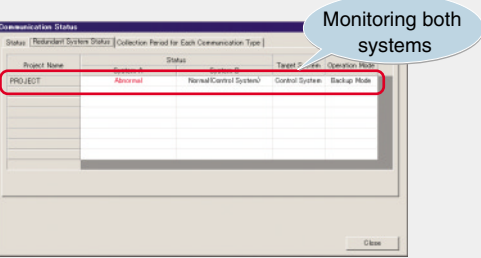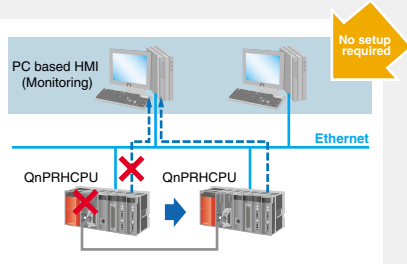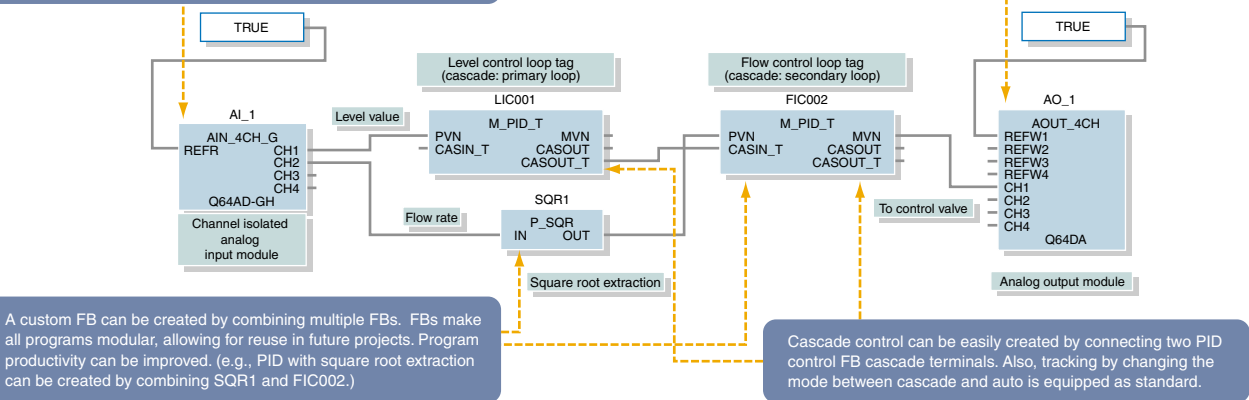
FBD programming screen

Monitoring screen

PC for engineering and monitoring

CC-Link IE Controller Network, MELSECNET/H Controller Network, or Ethernet

● Process CPU

● Channel isolated/non-isolated analog module
● I/O module

Raw materials, intermediate, or finished products

Analog input
Analog output

Set level value
Analog input

Fluid level
Level value

LIC 001

Primary manipulated value

Level meter
Level control loop (cascade: primary loop)

Square root extraction

FIC 002 Flow control loop (cascade: secondary loop)

Tank

Secondary manipulated value

LIC : Level control
FIC : Flow control

Flow meter
Control valve

Example of describing the above loop control application with PX Developer

Analog and I/O modules are represented by FBs. The actual I/O processing can be created just by connecting the FBs.

[Fluid level control]

TRUE

Level control loop tag (cascade: primary loop)

Flow control loop tag (cascade: secondary loop)

TRUE

AI_1
AIN_4CH_G
REFR CH1
        CH2
        CH3
        CH4
Q64AD-GH

Level value

LIC001
M_PID_T
PVN   MVN
CASIN_T   CASOUT
           CASOUT_T

FIC002
M_PID_T
PVN   MVN
CASIN_T   CASOUT
           CASOUT_T

AO_1
AOUT_4CH
REFW1
REFW2
REFW3
REFW4
CH1
CH2
CH3
CH4
Q64DA

Channel isolated analog input module

Flow rate

SQR1
P_SQR
IN   OUT

To control valve

Square root extraction

Analog output module

A custom FB can be created by combining multiple FBs. FBs make all programs modular, allowing for reuse in future projects. Program productivity can be improved. (e.g., PID with square root extraction can be created by combining SQR1 and FIC002.)

Cascade control can be easily created by connecting two PID control FB cascade terminals. Also, tracking by changing the mode between cascade and auto is equipped as standard.
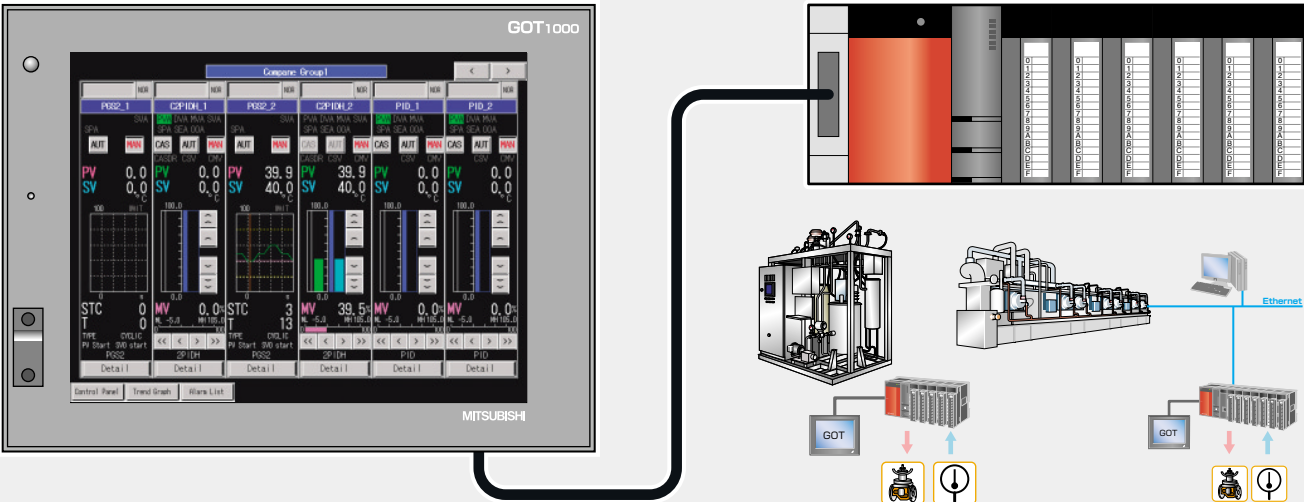
PX Developer
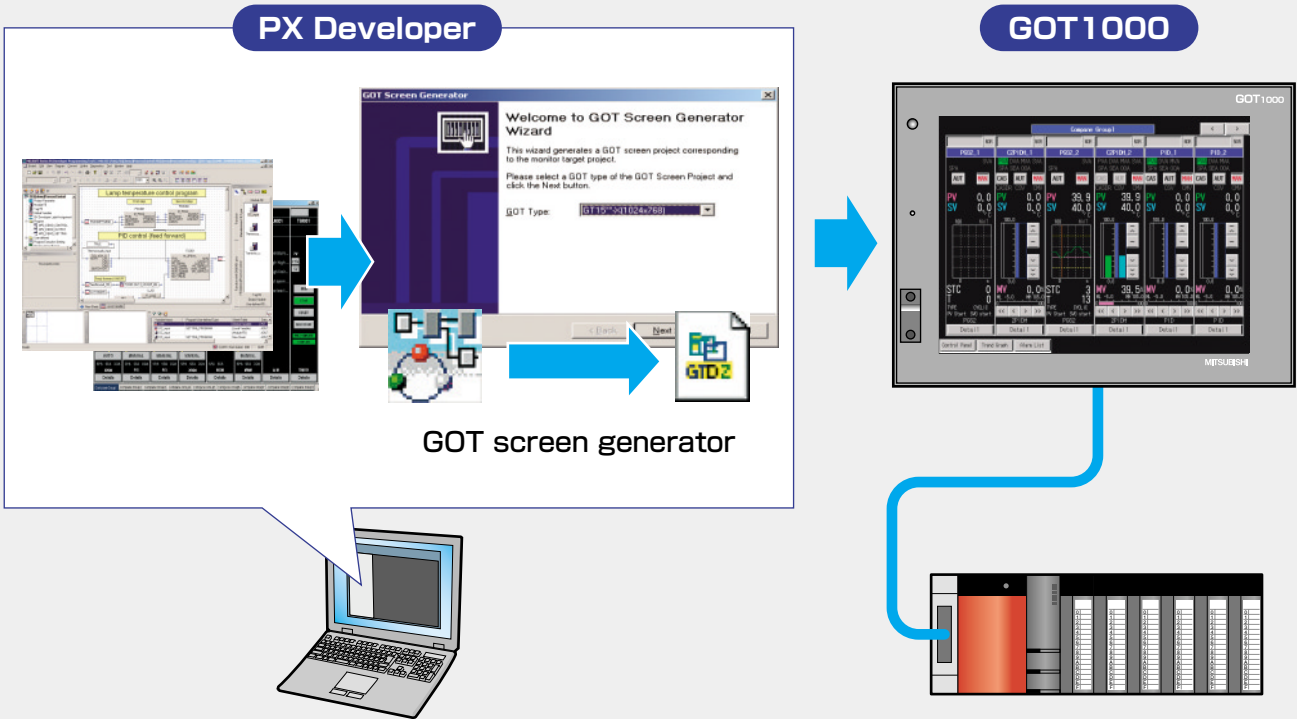
GOT screen generator function

Equipment/shop floor monitoring by GOT1000

GOT1000 can be used for monitoring equipment and shop floor.

Easy to create GOT1000 process control monitoring screens

・Faceplates and tuning screens for GOT1000 can be automatically generated from PX Developer projects.
・Tag's assigned device settings or programs are not needed for the auto-generated screens.

PX Developer

GOT screen generator

GOT1000

The following screens can be generated with the GOT screen generator function.

Faceplate　　　**Control panel screen**　　　**Alarm list screen**

Trend graph screen　　　**Tuning screen**

Tag setting screen　　　**Program setting screen**

Item	Specifications
Supported CPU	Process CPU (Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU), Redundant CPU (Q12PRHCPU, Q25PRHCPU)
Supported GOT	XGA: GT1595-XTBA, GT1595-XTBD SVGA: GT1585V-STBA, GT1585V-STBD, GT1585-STBA, GT1585-STBD, GT1575V-STBA, GT1575V-STBD, GT1575-STBA, GT1575-STBD GT SoftGOT1000 (screen size: 1024 x 768 dot [XGA], 800 x 600 dot [SVGA] only)
Supported GT Designer2[Note 1]	Version 2.82L or later: Q02PHCPU, Q06PHCPU Version 2.73B or later: Q12PHCPU, Q25PHCPU, Q12PRHCPU, Q25PRHCPU
Functions (outline)	・Number of generable tags: Max. 120 (loop tags and status tags) ・Generable screens: Faceplate, control panel, and detailed screens (tuning screen, setting screen, alarm list screen, and trend graph screen) ・Number of faceplates on control panel: 8/screen (XGA), 6/screen (SVGA) ・Connection path: One-to-one connection between GOT1000 and target CPU (host station) 　▶Process CPU: CPU direct connection, bus connection, computer link connection, Ethernet connection 　▶Redundant CPU: Computer link connection, Ethernet connection　(Refer to user's manual for details) ・Tuning trend cycle: 1 s or more

Note 1) GT Designer2 is required to use the GOT generator function.

Software supporting redundant system

GX Developer

GX Developer is a comprehensive programming tool that improves work efficiency in development, debugging, and maintenance of programmable controllers. To support the redundant system, it provides dedicated parameter settings and functions such as online program download to both systems (control/standby).

Easy to modify programs
Using the following functions, programs can be written to both control and standby systems simultaneously. These functions simplify program modifications, cutting down development time.

◎Writing programs and parameter files to programmable controllers

◎Online change (editing and writing programs to the programmable controllers while online)

GX Developer

Writing to programmable controllers and online change performed to both systems with just a single operation!

Just like handling a single programmable controller!

Write to both systems

Ethernet

Control system   Standby system
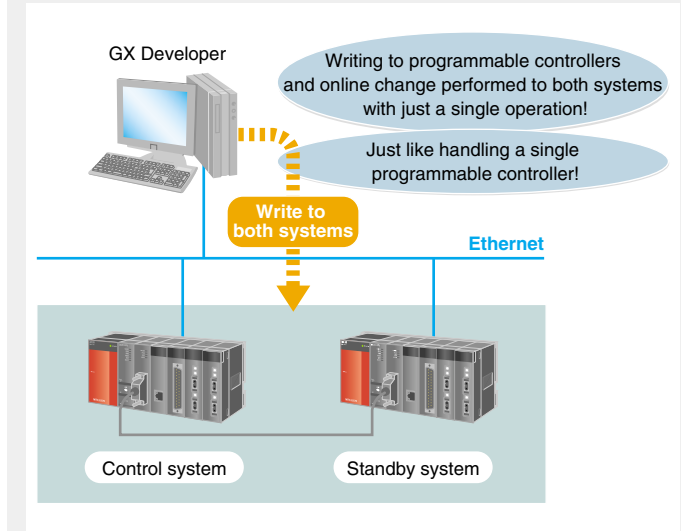
Simple parameter settings for the redundant system
The redundant system settings such as tracking settings, which maintain device status of both systems consistent, are designed in a familiar format to GX Developer users.
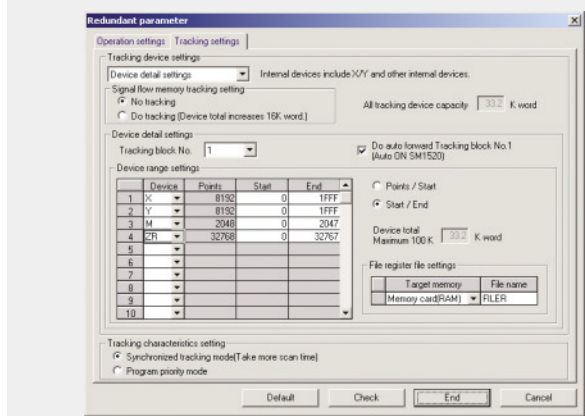
Monitoring module errors
The status of the CPUs, intelligent function modules, and redundant power supply modules can be monitored. Hence, faulty modules can be quickly identified.
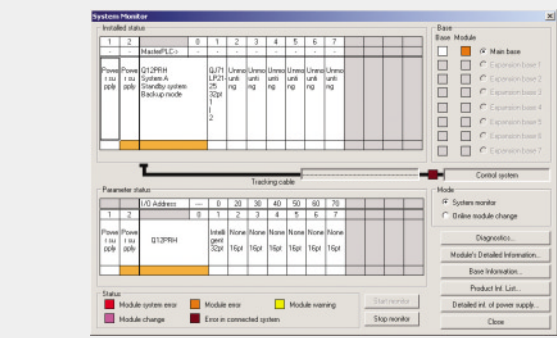
Continuous operation even at system switching
In the event of system switching due to a stop error in the CPU, the access target will be automatically switched. The operation continues smoothly, freeing the operator from having to consider system switching.

GX Developer

Connected to control system

Ethernet

Tracking cable

Control system   Standby system

System switching

GX Developer

Connected to control system

Ethernet

Tracking cable

Control (error) ◆ Standby   Standby ◆ Control
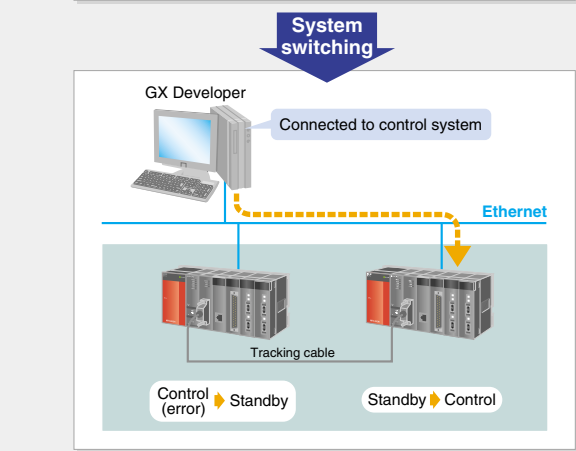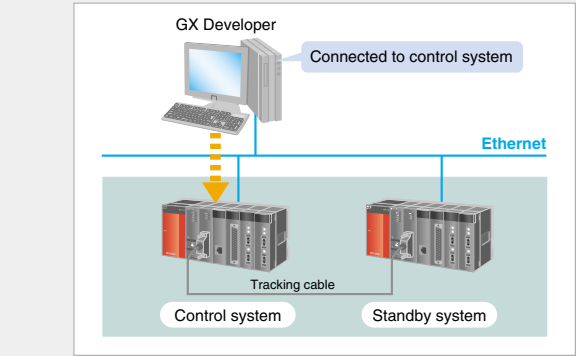
Software supporting redundant system

MX Component

MX Component is an ActiveX control library that supports all communication paths, from the PC to the programmable controller, and enables communications by simple processing. User applications can be easily configured without having to concern about system switching.

Simple communication settings
Selecting "Control system" as the target system makes the redundant system available: all other communication settings are the same as the standard system.
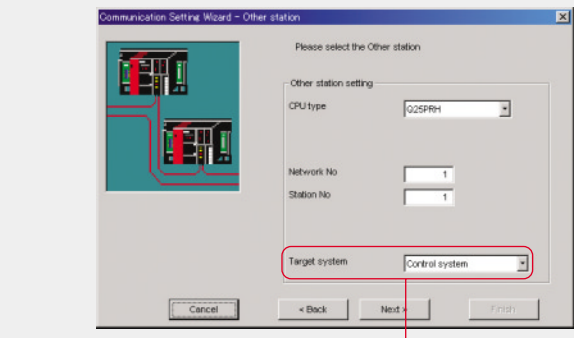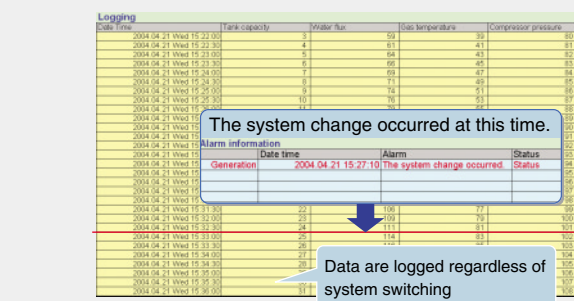
Select "Control system" for the redundant system.

Utilization of existing software
Existing user applications created with MX Component can be used for the redundant system simply by changing the communication settings.

Supports the redundant system
MX Sheet enables monitoring, logging, etc. of the programmable controller system using Excel without programming. It runs by MX Components, supporting the redundant system.

The system change occurred at this time.

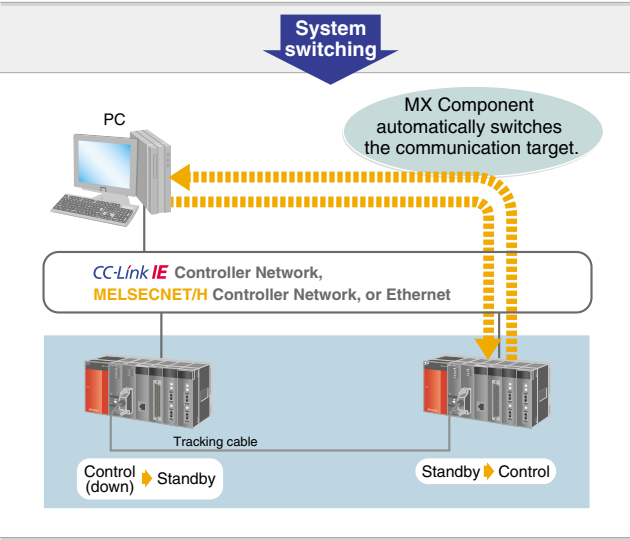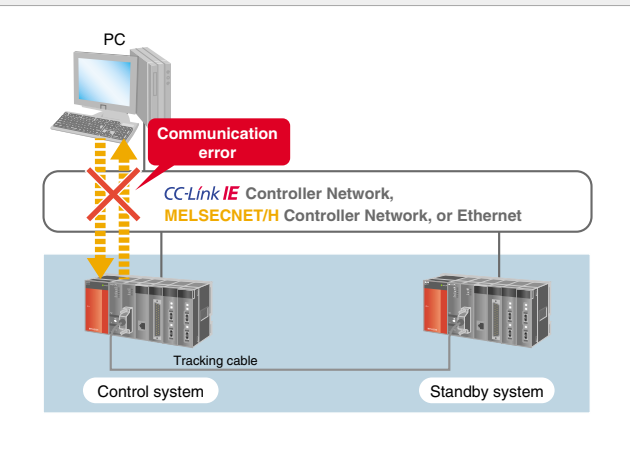Data are logged regardless of system switching

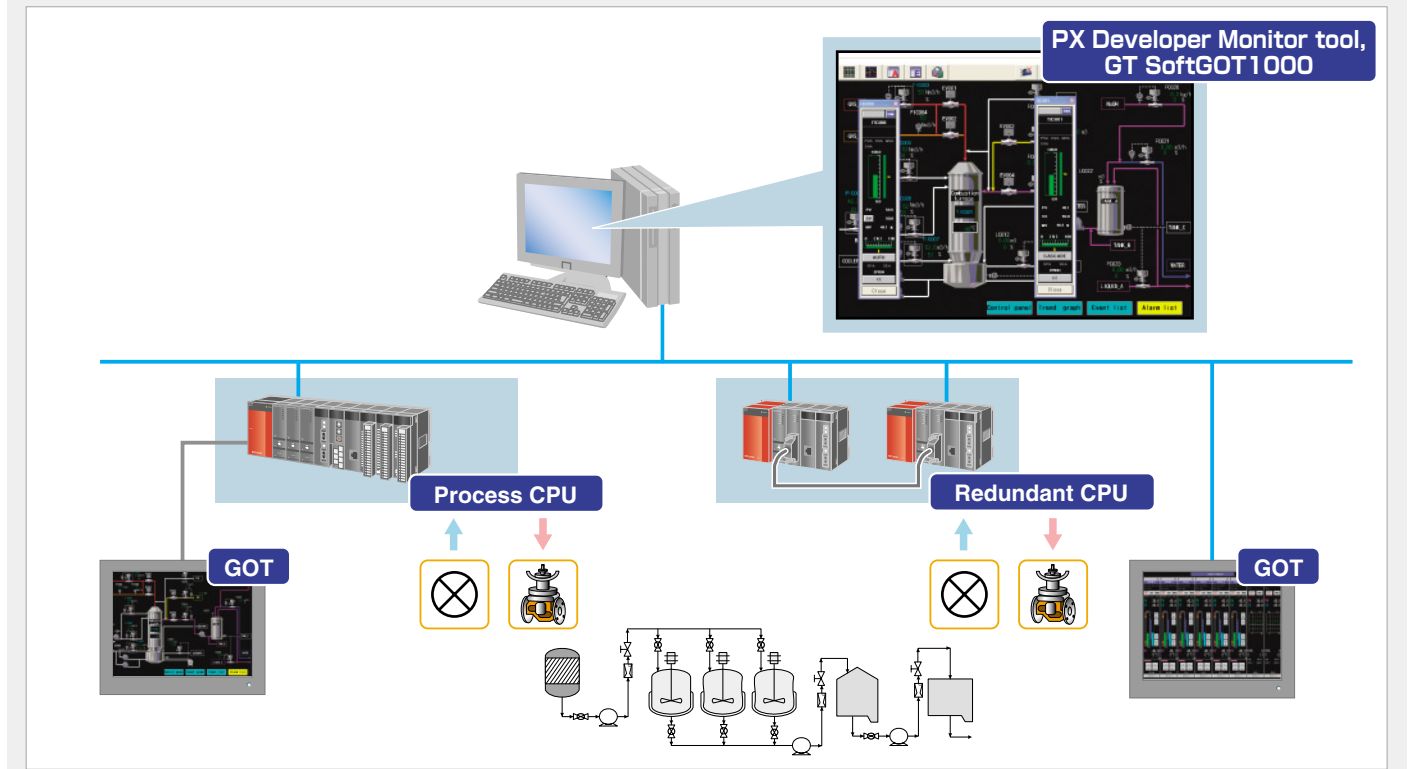### Simplifies troubleshooting after system switching
MX Component constantly monitors some of the redundant CPU devices. Hence, it is easy to know whether the currently-accessed CPU is a control system or standby system. When the system is switched, diagnostics and troubleshooting can be performed using GX Developer.

Easy programming
The redundant system application can be programmed without being conscious of the redundancy. When system switching occurs due to a control system failure, communication is automatically continued with the new control system switched from the standby system. Programming is not required to switch the communication target, reducing development time.

PC

Communication error

CC-Link IE Controller Network, MELSECNET/H Controller Network, or Ethernet

Tracking cable

Control system   Standby system

System switching

PC

MX Component automatically switches the communication target.

CC-Link IE Controller Network, MELSECNET/H Controller Network, or Ethernet

Tracking cable

Control (down) ◆ Standby   Standby ◆ Control

HMI (human machine interface) enables process control system monitoring.

PX Developer Monitor tool, GT SoftGOT1000
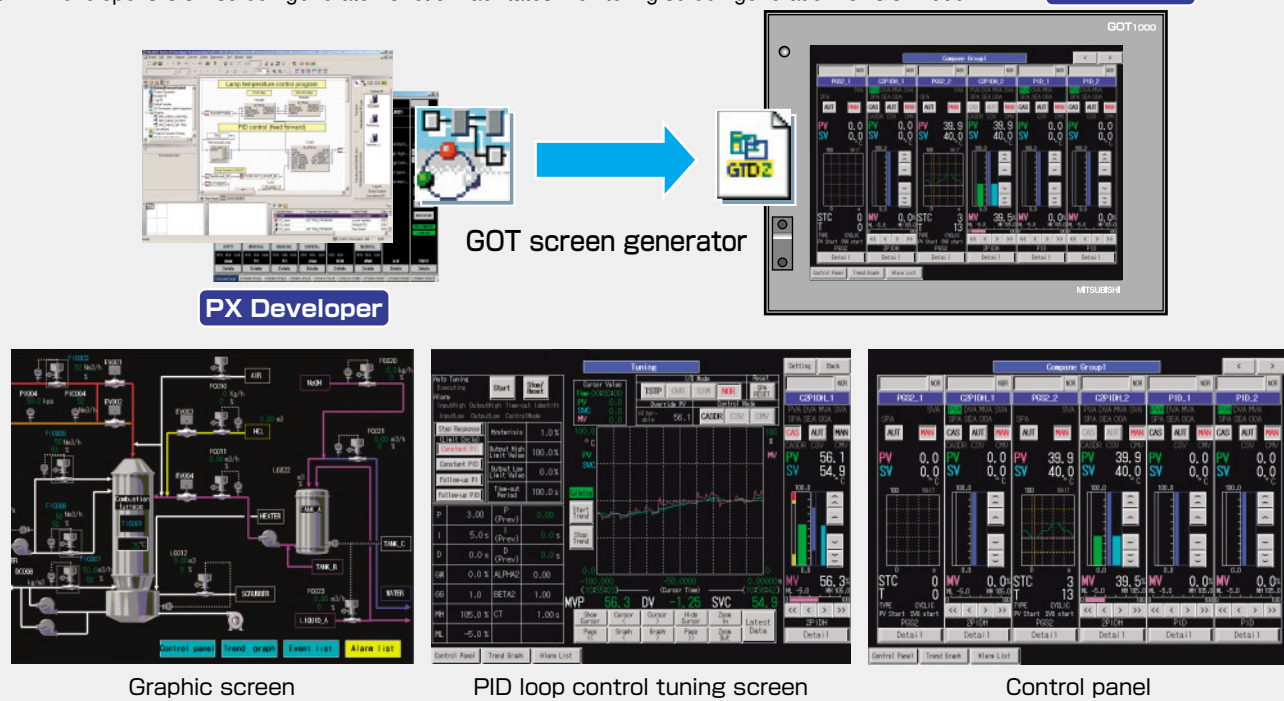
Process CPU

Redundant CPU

GOT

GOT

GOT1000

Features

Usable at various sites

The PX Developer's GOT screen generator function facilitates monitoring screen generation for GOT1000.
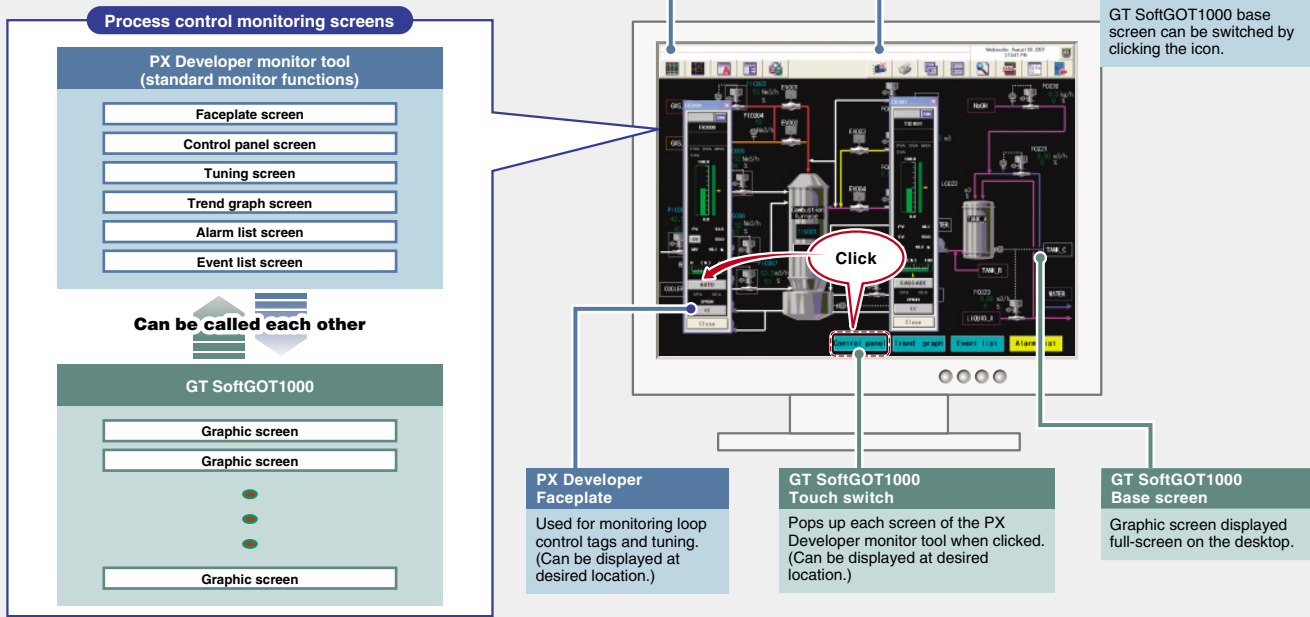
GOT1000

GOT screen generator

PX Developer

Graphic screen   PID loop control tuning screen   Control panel

GT SoftGOT1000

Features

Easy to create process control monitoring screen

· The standard monitor functions of PX Developer monitor tool can be called from the graphic screen of GT SoftGOT1000 and vice versa[Note 1], dramatically reducing screen designing time.
· Can be used on a PC. It is best suited for monitoring at the office.
· GOT1000 screens can be utilized, reducing time for creating new screens.

Note 1) PX Developer 1.13P or later is required.

Process control monitoring screens

PX Developer monitor tool (standard monitor functions)
- Faceplate screen
- Control panel screen
- Tuning screen
- Trend graph screen
- Alarm list screen
- Event list screen

Can be called each other

GT SoftGOT1000
- Graphic screen
- Graphic screen
- Graphic screen

Click

PX Developer Monitor tool bar
GT SoftGOT1000 base screen can be switched by clicking the icon.

PX Developer Faceplate
Used for monitoring loop control tags and tuning. (Can be displayed at desired location.)

GT SoftGOT1000 Touch switch
Pops up each screen of the PX Developer monitor tool when clicked. (Can be displayed at desired location.)

GT SoftGOT1000 Base screen
Graphic screen displayed full-screen on the desktop.

GT Designer 2

Features

Easy to create process control monitoring screen

· Using high quality parts library and various fonts, beautiful and visible screens can be easily designed.
· Both GOT1000 and GT SoftGOT1000 screens can be created.
· Easy to create a language switching screen.
· Easy to register comment (alarm) with Excel operability.

Supports the redundant system

With the redundant settings, the redundant system can be easily monitored.
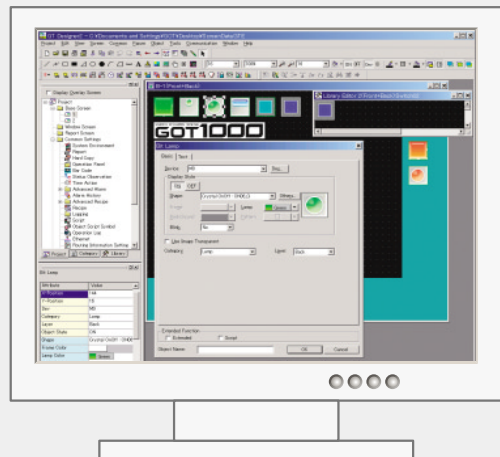
Software

Product name	Model	Version
GT Designer2 Version2	SW2D5C-GTD2-J	2.45X or later (when using SoftGOT interaction), 2.82L or later (when using GOT screen generator: Q02/06PHCPU)
GT Works2 Version2	SW2D5C-GTWK2-J	2.45X or later (when using SoftGOT interaction), 2.73B or later (when using GOT screen generator: Q12/25PHCPU, Q12/25PRHCPU)

Notes) · GT SoftGOT1000 is included in GT Works2 Version2 and GT Designer2 Version2.
     Prepare the above software when using GT SoftGOT1000.
    · A licence key (GT15-SGTKEY-P or GT15-SGTKEY-U) is required to use GT SoftGOT1000.
    · Refer to the GOT1000 Series catalog for details.

Ensuring an extensive global support network meeting diverse support for today's needs

Complying with international quality assurance standards

All of Mitsubishi Electric's FA component products have acquired the international quality assurance "ISO9001" and environment management system standard "ISO14001" certification. Mitsubishi's products also comply with various safety standards, including UL standards, and shipping standards.

Safety Standards

CE	CE···Council Directive of the European Communities	UL	UL···Underwriters Laboratories Listing

Shipping Standards

LR	LR···Lloyd's Register of Shipping approval	DNV	DNV···Norwegian Maritime approval	RINA	RINA···Italian Maritime approval
ClassNK	NK···ClassNK approval	ABS	ABS···American Bureau of Shipping approval	BUREAU VERITAS	BV···Bureau Veritas approval
GL	GL···Germanischer Lloyd approval				

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"Mitsubishi Global FA Centers" are located throughout North America, Europe, and Asia to develop products complying with international standards and to provide attentive services.

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Area covered: China

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*Always refer to user's manuals for information on usable modules, restrictions, etc. before using.
*Contact your local Mitsubishi sales office or representative for the latest information on the MELSOFT versions and compatible OS.
🔲 Usable with process CPU   🔲 Usable with MELSECNET/H remote I/O
🔲 Usable with high performance model   🔲 Usable with redundant CPU

CPU, base, power supply

Product		Model	Outline
CPU	High performance model	Q02CPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 28 k steps, basic instruction processing speed (LD instruction): 0.079 μs, program memory capacity: 112 KB
		Q02HCPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 28 k steps, basic instruction processing speed (LD instruction): 0.034 μs, program memory capacity: 112 KB
		Q06HCPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 60 k steps, basic instruction processing speed (LD instruction): 0.034 μs, program memory capacity: 240 KB
		Q12HCPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 124 k steps, basic instruction processing speed (LD instruction): 0.034 μs, program memory capacity: 496 KB
		Q25HCPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 252 k steps, basic instruction processing speed (LD instruction): 0.034 μs, program memory capacity: 1008 KB
	Process CPU	Q02PHCPU *New*	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 28 k steps, basic instruction processing speed (LD instruction): 0.034 μs, program memory capacity: 112 KB
		Q06PHCPU *New*	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 60 k steps, basic instruction processing speed (LD instruction): 0.034 μs, program memory capacity: 240 KB
		Q12PHCPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 124 k steps, basic instruction processing speed (LD instruction): 0.034 μs, program memory capacity: 496 KB
		Q25PHCPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 252 k steps, basic instruction processing speed (LD instruction): 0.034 μs, program memory capacity: 1008 KB
	Redundant CPU	Q12PRHCPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 124 k steps, basic instruction processing speed (LD instruction): 0.034 μs, program memory capacity: 496 KB
		Q25PRHCPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 252 k steps, basic instruction processing speed (LD instruction): 0.034 μs, program memory capacity: 1008 KB
	Motion CPU	Q172CPUN	For 8-axis control
		Q172CPUN-T	For 8-axis control, teaching module supported
		Q173CPUN	For 32-axis control
		Q173CPUN-T	For 32-axis control, teaching module supported
		Q172HCPU	For 8-axis control, SSCNET III connectivity
		Q172HCPU-T	For 8-axis control, SSCNET III connectivity, teaching module supported
		Q173HCPU	For 32-axis control, SSCNET III connectivity
		Q173HCPU-T	For 32-axis control, SSCNET III connectivity, teaching module supported
	Battery	Q6BAT	Replacement battery
		Q7BAT	Replacement large-capacity battery
		Q7BAT-SET	Large-capacity battery with battery holder for mounting CPU
		Q8BAT	Replacement large-capacity battery module
		Q8BAT-SET	Large-capacity battery module with CPU connection cable
	Memory card	Q2MEM-1MBS	SRAM memory card, capacity: 1 MB
		Q2MEM-2MBS	SRAM memory card, capacity: 2 MB
		Q2MEM-2MBF	Linear Flash memory card, capacity: 2 MB
		Q2MEM-4MBF	Linear Flash memory card, capacity: 4 MB
		Q2MEM-8MBA	ATA card, capacity: 8 MB
		Q2MEM-16MBA	ATA card, capacity: 16 MB
		Q2MEM-32MBA	ATA card, capacity: 32 MB
	Memory card adapter	Q2MEM-ADP	Adapter for Q2MEM memory card's standard PCMCIA slot
	SRAM card battery	Q2MEM-BAT	Replacement battery for Q2MEM-1MBS and Q2MEM-2MBS
	Connection cable	QC30R2	RS-232 cable for connecting personal computer and CPU, 3 m (between mini-DIN6P and Dsub9P)
	Tracking cable	QC10TR	1 m cable for tracking
		QC30TR	3 m cable for tracking
	Cable disconnection prevention holder	Q6HLD-R2	Holder for preventing RS-232 cable (programmable controller CPU connection) disconnection

CPU, base, power supply

Product		Model	Outline
Base	Main base	Q33B	3 slots, 1 power supply module required, for Q Series modules
		Q35B	5 slots, 1 power supply module required, for Q Series modules
		Q38B	8 slots, 1 power supply module required, for Q Series modules
		Q312B	12 slots, 1 power supply module required, for Q Series modules
	Redundant power main base	Q38RB	8 slots, 2 redundant power supply modules required, for Q Series modules
	Extension base	Q63B	3 slots, 1 power supply module required, for Q Series modules
		Q65B	5 slots, 1 power supply module required, for Q Series modules
		Q68B	8 slots, 1 power supply module required, for Q Series modules
		Q612B	12 slots, 1 power supply module required, for Q Series modules
		Q52B	2 slots, power supply module not required, for Q Series modules
		Q55B	5 slots, power supply module not required, for Q Series modules
	Redundant power extension base	Q68RB	8 slots, 2 redundant power supply modules required, for Q Series modules
	Redundant type extension base	Q65WRB	5 slots, 2 redundant power supply modules required, for Q Series modules
	Extension cable	QC05B	0.45 m cable for connecting extension base unit
		QC06B	0.6 m cable for connecting extension base unit
		QC12B	1.2 m cable for connecting extension base unit
		QC30B	3 m cable for connecting extension base unit
		QC50B	5 m cable for connecting extension base unit
		QC100B	10 m cable for connecting extension base unit
	Adapter	Q6DIN1	DIN rail mounting adapter for Q38B, Q312B, Q68B, Q612B, Q38RB, Q68RB, and Q65WRB
		Q6DIN2	DIN rail mounting adapter for Q35B and Q65B
		Q6DIN3	DIN rail mounting adapter for Q33B, Q52B, Q55B, and Q63B
		Q6DIN1A	DIN rail mounting adapter (with vibration-proofing bracket set) for Q3□B, Q5□B, Q6□B, Q38RB, Q68RB, and Q65WRB
	Blank cover	QG60	Blank cover for I/O slot
Power supply		Q61P	Input voltage: 100 to 240 V AC, output voltage: 5 V DC, output current: 6 A
		Q62P	Input voltage: 100 to 240 V AC, output voltage: 5/24 V DC, output current: 3/0.6 A
		Q63P	Input voltage: 24 V DC, output voltage: 5 V DC, output current: 6 A
		Q64PN (Note 9)	Input voltage: 100 to 240 V AC, output voltage: 5 V DC, output current: 8.5 A
Redundant power supply		Q63RP	Input voltage: 24 V DC, output voltage: 5 V DC, output current: 8.5 A
		Q64RP	Input voltage: 100 to 120/200 to 240 V AC, output voltage: 5 V DC, output current: 8.5 A

*5 Usable at the second to seventh extension base stage.

I/O module

Product		Model	Outline
Input	AC	QX10	16 points, 100 to 120 V AC, 8 mA (100 V AC, 60 Hz)/7 mA (100 V AC, 50 Hz), response time: 20 ms, 16 points/common, 18-point terminal block
		QX10-TS **New**	16 points, 100 to 120 V AC, 8 mA (100 V AC, 60 Hz)/7 mA (100 V AC, 50 Hz), response time 20 ms, 16 points/common, two piece spring clamp terminal block
		QX28	8 points, 100 to 240 V AC, 17 mA (200 V AC, 60 Hz)/14 mA (200 V AC, 50 Hz)/8 mA (100 V AC, 60 Hz)/ 7 mA (100 V AC, 50 Hz), response time: 20 ms, 8 points/common, 18-point terminal block
	DC (Positive common) (Note 1)	QX40	16 points, 24 V DC, 4 mA, response time: 1/5/10/20/70 ms, 16 points/common, positive common, 18-point terminal block
		QX40-S1	16 points, 24 V DC, 6 mA, response time: 0.1/0.2/0.4/0.6/1 ms, 16 points/common, positive common, 18-point terminal block
		QX40-TS **New**	16 points, 24 V DC, 4 mA, response time 1/5/10/20/70 ms, 16 points/common, positive common two piece spring clamp terminal block
		QX41 (Note 2)	32 points, 24 V DC, 4 mA, response time: 1/5/10/20/70 ms, 32 points/common, positive common, 40-pin connector
		QX41-S1 (Note 2)	32 points, 24 V DC, 4 mA, response time: 0.1/0.2/0.4/0.6/1 ms, 32 points/common, positive common, 40-pin connector
		QX42 (Note 2)	64 points, 24 V DC, 4 mA, response time: 1/5/10/20/70 ms, 32 points/common, positive common, 40-pin connector
		QX42-S1 (Note 2)	64 points, 24 V DC, 4 mA, response time: 0.1/0.2/0.4/0.6/1 ms, 32 points/common, positive common, 40-pin connector
	AC/DC (Note 1)	QX50	16 points, 48 V AC/DC, 4 mA, response time: 20 ms, 16 points/common, positive/negative common, 18-point terminal block
	DC sensor (Note 1)	QX70	16 points, 5/12 V DC, 1.2 mA (5 V DC)/3.3 mA (12 V DC), response time: 1/5/10/20/70 ms, 16 points/common, positive/negative common, 18-point terminal block
		QX71 (Note 2)	32 points, 5/12 V DC, 1.2 mA (5 V DC)/3.3 mA (12 V DC), response time: 1/5/10/20/70 ms, 32 points/common, positive/negative common, 40-pin connector
		QX72 (Note 2)	64 points, 5/12 V DC, 1.2 mA (5 V DC)/3.3 mA (12 V DC), response time: 1/5/10/20/70 ms, 32 points/common, positive/negative common, 40-pin connector
	DC (Negative common) (Note 1)	QX80	16 points, 24 V DC, 4 mA, response time: 1/5/10/20/70 ms, 16 points/common, negative common, 18-point terminal block
		QX80-TS **New**	16 points, 24 V DC, 4 mA, response time 1/5/10/20/70 ms, 16 points/common, negative common two piece spring clamp terminal block
		QX81 (Note 3)	32 points, 24 V DC, 4 mA, response time: 1/5/10/20/70 ms, 32 points/common, negative common, 37-pin D-sub connector
		QX82 (Note 2)	64 points, 24 V DC, 4 mA, response time: 1/5/10/20/70 ms, 32 points/common, negative common, 40-pin connector
		QX82-S1 (Note 2)	64 points, 24 V DC, 4 mA, response time: 0.1/0.2/0.4/0.6/1 ms, 32 points/common, negative common, 40-pin connector
Output	Relay	QY10	16 points, 24 V DC/240 V AC, 2 A/point, 8 A/common, response time: 12 ms, 16 points/common, 18-point terminal block
		QY10-TS **New**	16 points, 24 V DC/240 V AC, 2 A/point, 8 A/common, response time 12 ms, 16 points/common, two piece spring clamp terminal block
		QY18A	8 points, 24 V DC/240 V AC, 2 A/point, response time: 12 ms, 18-point terminal block, all points independent
	Triac	QY22	16 points; 100 to 240 V AC; 0.6 A/point; 4.8 A/common; minimum load voltage/current: 24 V AC/100 mA, 100 to 240 V AC/25 mA; response time: 1 ms + 0.5 cycle, 16 points/common, 18-point terminal block, with surge suppressor
	Transistor (Sink)	QY40P	16 points, 12 to 24 V DC, 0.1 A/point, 1.6 A/common, response time: 1 ms, 16 points/common, sink type, 18-point terminal block, with thermal and short-circuit protection and surge suppressor
		QY40P-TS **New**	16 points, 12 to 24 V DC, 0.1 A/point, 1.6 A/common, response time: 1 ms, 16 points/common, sink type, two piece spring clamp terminal block, with thermal and short-circuit protection and surge suppressor
		QY41P (Note 2)	32 points, 12 to 24 V DC, 0.1 A/point, 2 A/common, response time: 1 ms, 32 points/common, sink type, 40-pin connector, with thermal and short-circuit protection and surge suppressor
		QY42P (Note 2)	64 points, 12 to 24 V DC, 0.1 A/point, 2 A/common, response time: 1 ms, 32 points/common, sink type, 40-pin connector, with thermal and short-circuit protection and surge suppressor
		QY50	16 points, 12 to 24 V DC, 0.5 A/point, 4 A/common, response time: 1 ms, 16 points/common, sink type, 18-point terminal block, with surge suppressor and fuse
	Transistor (Independent)	QY68A	8 points, 5 to 24 V DC, 2 A/point, 8 A/module, response time: 10 ms, sink/source type, 18-point terminalblock, with surge suppressor, all points independent
	TTL CMOS	QY70	16 points, 5 to 12 V DC, 16 mA/point, 256 mA/common, response time: 0.5 ms, 16 points/common, sink type, 18-point terminal block, with fuse
		QY71 (Note 2)	32 points, 5 to 12 V DC, 16 mA/point, 512 mA/common, response time: 0.5 ms, 32 points/common, sink type, 40-pin connector, with fuse
	Transistor (Source)	QY80	16 points, 12 to 24 V DC, 0.5 A/point, 4 A/common, response time: 1 ms, 16 points/common, source type, 18-point terminal block, with surge suppressor and fuse
		QY80-TS **New**	16 points, 12 to 24 V DC, 0.5 A/point, 4 A/common, response time: 1 ms, 16 points/common, source type, two piece spring clamp terminal block, with surge suppressor and fuse
		QY81P (Note 3)	32 points, 12 to 24 V DC, 0.1 A/point, 2 A/common, response time: 1 ms, 32 points/common, source type, 37-pin D-sub connector, with thermal and short-circuit protection and surge suppressor

I/O module

Product		Model	Outline
I/O	DC input/ transistor output	QH42P (Note 2)	Input: 32 points, 24 V DC, 4 mA, response time: 1/5/10/20/70 ms, 32 points/common, positive common; output: 32 points, 12 to 24 V DC, 0.1 A/point, 2 A/common, response time: 1 ms, 32 points/common, sink type; 40-pin connector, with thermal and short-circuit protection and surge suppressor
		QX48Y57	Input: 8 points, 24 V DC, 4 mA, response time: 1/5/10/20/70 ms, 8 points/common, positive common; output: 7 points, 12 to 24 V DC, 0.5 A/point, 2 A/common, response time: 1 ms, 7 points/common, sink type; 18 points terminal block, with surge suppressor and fuse
		QX41Y41P (Note 2)	Input: 32 points, 24 V DC, 4 mA, response time: 1/5/10/20/70 ms, 32 points/common, positive common; output: 32 points, 12 to 24 V DC, 0.1 A/point, 2 A/common, response time: 1 ms, 32 points/common, sink type; 40-pin connector, with thermal and short-circuit protection and surge suppressor
Interrupt module		QI60	16 points, 24 V DC, 4 mA, response time: 0.1/0.2/0.4/0.6/1 ms, 16 points/common, 18-point terminal block
Connector		A6CON1	40-pin connector, soldering type
		A6CON2	40-pin connector, crimp-contact type
		A6CON3	40-pin connector, IDC for flat cables
		A6CON4	40-pin connector, soldering type (cable connectable in bidirection)
		A6CON1E	37-pin D-sub connector, soldering type
		A6CON2E	37-pin D-sub connector, crimp-contact type
		A6CON3E	37-pin D-sub connector, IDC for flat cables
Spring clamp terminal block		Q6TE-18S	For 16-point I/O modules, 0.3 to 1.5 mm^2 (22 to 16 AWG)
Terminal block adapter		Q6TA32	For 32-point I/O modules, 0.5 mm^2 (20 AWG)
		Q6TA32-TOL	Q6TA32 dedicated tool
Connector/terminal block conversion module		A6TBXY36	For positive common input modules and sink output modules (standard type)
		A6TBXY54	For positive common input modules and sink output modules (2-wire type)
		A6TBX70	For positive common input modules (3-wire type)
		A6TBX36-E	For negative common input modules (standard type)
		A6TBX54-E	For negative common input modules (2-wire type)
		A6TBX70-E	For negative common input modules (3-wire type)
		A6TBY36-E	For source output modules (standard type)
		A6TBY54-E	For source output modules (2-wire type)
	Cable	AC05TB	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type); 0.5 m
		AC10TB	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type); 1 m
		AC20TB	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type); 2 m
		AC30TB	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type); 3 m
		AC50TB	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type); 5 m
		AC80TB	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type); 8 m *Common current 0.5 A or lower
		AC100TB	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type); 10 m *Common current 0.5 A or lower
		AC05TB-E	For A6TBX36-E, A6TBY36-E, A6TBX54-E, A6TBY54-E, and A6TBX70-E (negative common/source type); 0.5 m
		AC10TB-E	For A6TBX36-E, A6TBY36-E, A6TBX54-E, A6TBY54-E, and A6TBX70-E (negative common/source type); 1 m
		AC20TB-E	For A6TBX36-E, A6TBY36-E, A6TBX54-E, A6TBY54-E, and A6TBX70-E (negative common/source type); 2 m
		AC30TB-E	For A6TBX36-E, A6TBY36-E, A6TBX54-E, A6TBY54-E, and A6TBX70-E (negative common/source type); 3 m
		AC50TB-E	For A6TBX36-E, A6TBY36-E, A6TBX54-E, A6TBY54-E, and A6TBX70-E (negative common/source type); 5 m
Relay terminal module		A6TE2-16SRN	For 40-pin connector 24 V DC transistor output modules (sink type)
	Cable	AC06TE	For A6TE2-16SRN, 0.6 m
		AC10TE	For A6TE2-16SRN, 1 m
		AC30TE	For A6TE2-16SRN, 3 m
		AC50TE	For A6TE2-16SRN, 5 m
		AC100TE	For A6TE2-16SRN, 10 m

Analog I/O module

Product		Model	Outline
Analog input	Voltage input	Q68ADV	8 channels; input: -10 to 10 V DC; output (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, 0 to 16000, -16000 to 16000; conversion speed: 80 μs/channel; 18-point terminal block
	Current input	Q62AD-DGH	2 channels; input: 4 to 20 mA DC; output (resolution): 0 to 32000, 0 to 64000; conversion speed: 10 ms/2 channels; 18-point terminal block; channel isolated; supplies power to 2-wire transmitter
		Q66AD-DG (Note 5)	6 channels; input: 4 to 20 mA DC (when 2-wire transmitter is connected), 0 to 20 mA DC; output (resolution): 0 to 4000, 0 to 12000; conversion speed: 10 ms/channel; 40-pin connector; channel isolated; supplies power to 2-wire transmitter
		Q68ADI	8 channels; input: 0 to 20 mA DC; output (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, 0 to 16000, -16000 to 16000; conversion speed: 80 μs/channel; 18-point terminal block
	Voltage/ current input	Q64AD	4 channels; input: -10 to 10 V DC, 0 to 20 mA DC; output (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, 0 to 16000, -16000 to 16000; conversion speed: 80 μs/channel; 18-point terminal block
		Q64AD-GH	4 channels; input: -10 to 10 V DC, 0 to 20 mA DC; output (resolution): 0 to 32000, -32000 to 32000, 0 to 64000, -64000 to 64000; conversion speed: 10 ms channels; 18-point terminal block, channel isolated
		Q68AD-G (Note 5)	8 channels; input: -10 to 10 V DC, 0 to 20 mA DC; output (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, 0 to 16000, -16000 to 16000; conversion speed: 10 ms/channel; 40-pin connector, channel isolated
Analog output	Voltage output	Q68DAVN	8 channels; input (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, -16000 to 16000; output: -10 to 10 V DC; conversion speed: 80 μs/channel; 18-point terminal block, transformer isolation between power supply and output
	Current output	Q68DAIN	8 channels; input (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000; output: 0 to 20 mA DC; conversion speed: 80 μs/channel; 18-point terminal block, transformer isolation between power supply and output
	Voltage/ current output	Q62DAN	2 channels; input (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, -16000 to 16000; output: -10 to 10 V DC, 0 to 20 mA DC; conversion speed: 80 μs/channel; 18-point terminal block, transformer isolation between power supply and output
		Q62DA-FG	2 channels; input (resolution): 0 to 12000, -12000 to 12000, -16000 to 16000; output: -12 to 12 V DC, 0 to 22 mA DC; conversion speed: 10 ms/2 channels; 18-point terminal block; channel isolated
		Q64DAN	4 channels; input (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, -16000 to 16000; output: -10 to 10 V DC, 0 to 20 mA DC; conversion speed: 80 μs/channel; 18-point terminal block; transformer isolation between power supply and output
		Q66DA-G (Note 5)	6 channels; input (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, -16000 to 16000; output: -12 to 12 V DC, 0 to 22 mA DC; conversion speed: 6 ms/channel; 40-pin connector; channel isolated
Temperature input	RTD	Q64RD	4 channels, platinum RTD (Pt100 [JIS C1604-1997, IEC 751 1983], JPt100 [JIS C1604-1981]), conversion speed: 40 ms/channel, 18-point terminal block
		Q64RD-G	4 channels, RTD (Pt100 [JIS C1604-1997, IEC 751 1983], JPt100 [JIS C1604-1981], Ni100 [DIN43760 1987]), conversion speed: 40 ms/channel, 18-point terminal block, channel isolated
		Q68RD3-G **New**	8 channels, RTD (3-wire type, Pt100 [JIS C1604-1997, IEC 751 1983], JPt100 [JIS C1604-1981]), Ni100 [DIN43760 1987]), conversion speed: 320 ms/8 channels, 40-pin connector, channel isolated
	Thermocouple	Q64TD	4 channels, thermocouple (JIS C1602-1995), conversion speed: 40 ms/channel, 18-point terminal block
		Q64TDV-GH	4 channels, thermocouple (JIS C1602-1995), micro voltage (-100 to 100 mV), conversion speed: sampling cycle x 3, sampling cycle: 20 ms/channel, 18-point terminal block
		Q68TD-G-H01 (Note 5, 10)	8 channels, thermocouple (JIS C1602-1995, IEC 60584-1 [1995], IEC 60584-2 [1982]), conversion speed: 320 ms/8 channels, 40-pin connector
Temperature control	Platinum RTD	Q64TCRT	4 channels, platinum RTD (Pt100, JPt100), no heater disconnection detection, sampling cycle: 0.5 s/4 channels, 18-point terminal block
		Q64TCRTBW	4 channels, platinum RTD (Pt100, JPt100), with heater disconnection detection, sampling cycle: 0.5 s/4 channels, two 18-point terminal blocks
	Thermocouple	Q64TCTT	4 channels, thermocouple (K, J, T, B, S, E, R, N, U, L, PLII, W5Re/W26Re), no heater disconnection detection, sampling cycle: 0.5 s/4 channels, 18-point terminal block
		Q64TCTTBW	4 channels, thermocouple (K, J, T, B, S, E, R, N, U, L, PLII, W5Re/W26Re), with heater disconnection detection, sampling cycle: 0.5 s/4 channels, two 18-point terminal blocks
Loop control		Q62HLC	2 channels, input: thermocouple/micro voltage/voltage/current, conversion speed (input): 25 ms/2 channels, sampling cycle: 25 ms/2 channels; output: 4 to 20 mA DC, conversion speed (output): 25 ms/2 channels; 18-point terminal block with 5 PID control modes

Interrupt pointer and intelligent function module dedicated instructions cannot be used.

Mountable on the extension base unit only.

Pulse I/O and positioning module

Product	Model	Outline
Channel isolated pulse input	QD60P8-G	8 channels, 30 kpps/10 kpps/1 kpps/ 100 pps/ 50 pps/ 10 pps/ 1 pps/0.1 pps, count input signal: 5/12 to 24 V DC
High-speed counter	QD62 (Note 2)	2 channels; 200/100/10 kpps; count input signal: 5/12/24 V DC; external input: 5/12/24 V DC; coincidence output: transistor (sink), 12/24 V DC, 0.5 A/point, 2 A/common; 40-pin connector
	QD62D (Note 2)	2 channels; 500/200/100/10 kpps; count input signal: EIA standards RS-422-A (differential line driver), external input: 5/12/24 V DC; coincidence output: transistor (sink), 12/24 V DC, 0.5 A/point, 2 A/common; 40-pin connector
	QD62E (Note 2)	2 channels; 200/100/10 kpps; count input signal: 5/12/24 V DC; external input: 5/12/24 V DC; coincidence output: transistor (source), 12/24 V DC, 0.1 A/point, 0.4 A/common; 40-pin connector
	QD63P6 (Note 4)	6 channels, 200/100/10 kpps, count input signal: 5 V DC, 40-pin connector
	QD64D2 (Note 4)	2 channels; 4 Mpps; count input signal: EIA standards RS-422-A (differential line driver); external input: 24 V DC; coincidence output: transistor (sink), 12/24 V DC, 0.5 A/point, 2 A/common; 40-pin connector
Positioning — Open collector output (Note 4)	QD75P1	1 axis; control unit: mm, inch, degree, pulse; no. of positioning data: 600/axis; max. output pulse: 200 kpps; 40-pin connector
	QD75P2	2 axes; 2-axis linear interpolation, 2-axis circular interpolation; control unit: mm, inch, degree, pulse; no. of positioning data: 600/axis; max. output pulse: 200 kpps; 40-pin connector
	QD75P4	4 axes; 2-/3-/4-axis linear interpolation, 2-axis circular interpolation; control unit: mm, inch, degree, pulse; no. of positioning data: 600/axis; max. output pulse: 200 kpps; 40-pin connector
	QD70P4	4 axes, control unit: pulse, no. of positioning data: 10/axis, max. output pulse: 200 kpps, 40-pin connector
	QD70P8	8 axes, control unit: pulse, no. of positioning data: 10/axis, max. output pulse: 200 kpps, 40-pin connector
Positioning — Differential output (Note 4)	QD75D1	1 axis; control unit: mm, inch, degree, pulse; no. of positioning data: 600/axis; max. output pulse: 1 Mpps; 40-pin connector
	QD75D2	2 axes; 2-axis linear interpolation, 2-axis circular interpolation; control unit: mm, inch, degree, pulse; no. of positioning data: 600/axis; max. output pulse: 1 Mpps; 40-pin connector
	QD75D4	4 axes; 2-/3-/4-axis linear interpolation, 2-axis circular interpolation; control unit: mm, inch, degree, pulse; no. of positioning data: 600/axis; max. output pulse: 1 Mpps; 40-pin connector
	QD70D4	4 axes, control unit: pulse, no. of positioning data: 10/axis, max. output pulse: 4 Mpps, 40-pin connector
	QD70D8	8 axes, control unit: pulse, no. of positioning data: 10/axis, max. output pulse: 4 Mpps, 40-pin connector
Positioning — With SSCNET connectivity (Note 2)	QD75M1	1 axis; control unit: mm, inch, degree, pulse; no. of positioning data: 600/axis; 40-pin connector
	QD75M2	2 axes; 2-axis linear interpolation, 2-axis circular interpolation; control unit: mm, inch, degree, pulse; no. of positioning data: 600/axis; 40-pin connector
	QD75M4	4 axes; 2-/3-/4-axis linear interpolation, 2-axis circular interpolation; control unit: mm, inch, degree, pulse; no. of positioning data: 600/axis; 40-pin connector
Positioning — With SSCNET III connectivity (Note 2)	QD75MH1	1 axis; control unit: mm, inch, degree, pulse; no. of positioning data: 600/axis; 40-pin connector; with SSCNET III connectivity
	QD75MH2	2 axes; 2-axis linear interpolation, 2-axis circular interpolation; control unit: mm, inch, degree, pulse; no. of positioning data: 600/axis; 40-pin connector; with SSCNET III connectivity
	QD75MH4	4 axes; 2-/3-/4-axis linear interpolation, 2-axis circular interpolation; control unit: mm, inch, degree, pulse; no. of positioning data: 600/axis; 40-pin connector; with SSCNET III connectivity
Positioning — Open collector output with built-in counter function (Note 4)	QD72P3C3	Positioning: 3 axes, control unit: pulse, no. of positioning data: 1/axis, max. output pulse: 100 kpps, counter: 3 channels, 100 kpps, count input signal: 5/24 V DC, 40-pin connector

[*1] Interrupt pointer and intelligent function module dedicated instructions cannot be used.

[*3] Mountable on the extension base unit only.

Information module

Product	Model	Outline
MES interface	QJ71MES96	MES interface module *MX MESInterface and CompactFlash card are required.
MES interface — Option	GT05-MEM-128MC	128 MB CompactFlash card
	GT05-MEM-256MC	256 MB CompactFlash card
Ethernet	QJ71E71-100	10BASE-T/100BASE-TX
	QJ71E71-B2	10BASE2
	QJ71E71-B5	10BASE5
Serial communication	QJ71C24N	RS-232: 1 channel, RS-422/485: 1 channel, total transmission speed of 2 channels: 230.4 kbps
	QJ71C24N-R2	RS-232: 2 channels, total transmission speed of 2 channels: 230.4 kbps
	QJ71C24N-R4	RS-422/485: 2 channels, total transmission speed of 2 channels: 230.4 kbps
Intelligent communication	QD51	BASIC program execution module, RS-232: 2 channels
	QD51-R24	BASIC program execution module, RS-232: 1 channel, RS-422/485: 1 channel
	SW☐IVD-AD51HP (Note 6)	Software package for QD51, AD51H-S3, and A1SD51S

Control network module

Product	Model	Outline
CC-Link IE Controller Network	QJ71GP21-SX	Multi-mode fiber optic cable, dual loop, controller network (control/normal station)
	QJ71GP21S-SX	Multi-mode fiber optic cable, dual loop, controller network (control/normal station), with external power supply function
MELSECNET/H — SI/QSI fiber optic cable	QJ71LP21-25	SI/QSI/H-PCF/ broadband H-PCF fiber optic cable, dual loop, controller network (control/normal station) or remote I/O network (remote mater station)
	QJ71LP21S-25	SI/QSI/H-PCF/ broadband H-PCF fiber optic cable, dual loop, controller network (control/normal station) or remote I/O network (remote mater station), with external power supply function
	QJ72LP25-25	SI/QSI/H-PCF/ broadband H-PCF fiber optic cable, dual loop, remote I/O network (remote I/O station)
MELSECNET/H — GI-50/125 fiber optic cable	QJ71LP21G	GI-50/125 fiber optic cable, dual loop, controller network (control/normal station) or remote I/O network (remote master station)
	QJ72LP25G	GI-50/125 fiber optic cable, dual loop, remote I/O network (remote I/O station)
MELSECNET/H — GI-62.5/125 fiber optic cable	QJ71LP21GE	GI-62.5/125 fiber optic cable, dual loop, controller network (control/normal station) or remote I/O network (remote master station)
	QJ72LP25GE	GI-62.5/125 fiber optic cable, dual loop, remote I/O network (remote I/O station)
MELSECNET/H — Coaxial cable	QJ71BR11	3C-2V/5C-2V coaxial cable, single bus, controller network (control/normal station) or remote I/O network (remote master station)
	QJ72BR15	3C-2V/5C-2V coaxial cable, single bus, remote I/O network (remote I/O station)
CC-Link	QJ61BT11N	Master/local station, CC-Link Ver. 2 compatible
CC-Link/LT	QJ61CL12	Master station
FL-net (OPCN-2) — Ver. 2	QJ71FL71-T-F01	10BASE-T, 100BASE-TX
	QJ71FL71-B2-F01	10BASE-2
	QJ71FL71-B5-F01	10BASE-5
FL-net (OPCN-2) — Ver. 1	QJ71FL71-T	10BASE-T
	QJ71FL71-B2	10BASE-2
	QJ71FL71-B5	10BASE-5
AS-i	QJ71AS92	Master station, AS-Interface Specification Version 2.11 compatible

[*1] Interrupt pointer and intelligent function module dedicated instructions cannot be used.

[*2] Interrupt pointer, intelligent function module dedicated instructions, and E-mail function cannot be used.

[*3] Mountable on the extension base unit only.

[*4] Mountable on the main base unit only.

PC interface board

Product		Model	Outline
CC-Link IE Controller Network		Q80BR-J71GP21-SX	PCI bus, Japanese/English OS compatible, multi-mode fiber optic cable, dual loop, controller network (control/normal station)
		Q80BR-J71GP21S-SX	PCI bus, Japanese/English OS compatible, multi-mode fiber optic cable, dual loop, controller network (control/normal station), with external power supply function
MELSEC NET/H (10)	SI/QSI fiber optic cable	Q81BD-J71LP21-25 New	PCI Express bus, Japanese/English OS compatible, multi-mode fiber optic cable, dual loop, controller network (control/normal station)
		Q80BD-J71LP21-25	PCI bus, Japanese/English OS compatible, SI/QSI/H-PCF/broadband H-PCF fiber optic cable, dual loop, controller network (control/normal station)
		Q80BD-J71LP21S-25	PCI bus, Japanese/English OS compatible, SI/QSI/H-PCF/broadband H-PCF fiber optic cable, dual loop, controller network (control/normal station), with external power supply function
	GI-50/125 fiber optic cable	Q80BD-J71LP21G	PCI bus, Japanese/English OS compatible, GI-50/125 fiber optic cable, dual loop, controller network (control/normal station)
	GI-62.5/125 fiber optic cable	Q80BD-J71LP21GE	PCI bus, Japanese/English OS compatible, GI-62.5/125 fiber optic cable, dual loop, controller network (control/normal station)
	Coaxial cable	Q80BD-J71BR11	PCI bus, Japanese/English OS compatible, 3C-2V/5C-2V coaxial cable, single bus, controller network (control/normal station)
CC-Link		Q81BD-J61BT11 New	PCI Express bus, Japanese/English OS compatible, master/local interface board, CC-Link Ver. 2 compatible
		Q80BD-J61BT11N	PCI bus, Japanese/English OS compatible, master/local interface board, CC-Link Ver. 2 compatible

MELSOFT GX Series

GX Developer	SW☐D5C-GPPW-E	MELSEC progrmmable controller programming software
	SW☐D5C-GPPW-EV	MELSEC programmable controller programming software (upgrade)
GX Simulator	SW☐D5C-LLT-E	MELSEC programmable controller simulation software
	SW☐D5C-LLT-EV	MELSEC programmable controller simulation software (upgrade)
GX Explorer	SW☐D5C-EXP-E	Maintenance tool
GX Converter	SW☐D5C-CNVW-E	Excel/text data converter
GX Configurator-AD	SW☐D5C-QADU-E	MELSEC-Q dedicated analog to digital conversion module setting/monitoring tool
GX Configurator-DA	SW☐D5C-QDAU-E	MELSEC-Q dedicated digital to analog conversion module setting/monitoring tool
GX Configurator-SC	SW☐D5C-QSCU-E	MELSEC-Q dedicated serial communication module setting/monitoring tool
GX Configurator-CT	SW☐D5C-QCTU-E	MELSEC-Q dedicated high-speed counter module setting/monitoring tool
GX Configurator-TC	SW☐D5C-QTCU-E	MELSEC-Q dedicated temperature control module setting/monitoring tool
GX Configurator-TI	SW☐D5C-QTIU-E	MELSEC-Q dedicated temperature input module setting/monitoring tool
GX Configurator-FL	SW☐D5C-QFLU-E	MELSEC-Q dedicated FL-net module setting/monitoring tool
GX Configurator-PT	SW☐D5C-QPTU-E	MELSEC-Q dedicated positioning module QD70 setting/monitoring tool
GX Configurator-AS	SW☐D5C-QASU-E	MELSEC-Q dedicated AS-i master module setting/monitoring tool
GX Configurator-QP	SW☐D5C-QD75P-E	MELSEC-Q dedicated positioning module QD75P/D/M setting/monitoring tool
GX Configurator-CC	SW☐D5C-J61P-E	CC-Link module setting/monitoring tool
GX RemoteService-I	SW☐D5C-RAS-E	Remote access tool
GX Works	SW☐D5C-QSET-E	A set of seven products: GX Developer, GX Simulator, GX Explorer, GX Configurator-AD, DA, SC, CT
	SW☐D5C-GPPLLT-E	A set of three products: GX Developer, GX Simulator, GX Explorer

MELSOFT PX Series

PX Developer	SW☐D5C-FBDQ-E	Process control FBD software package
PX Works	SW☐D5C-FBDGPP-E	A set of six products: PX Developer, GX Developer, GX Configurator-AD, DA, CT, TI

MELSOFT MX Series

Product	Model	Outline
MX Component	SW☐D5C-ACT-E	ActiveX library for communication
MX Sheet	SW☐D5C-SHEET-E	Excel communication support tool
MX MESInterface	SW1DNC-MESIF-E	MES interface module QJ71MES96 dedicated information linkage tool
MX Works	SW☐D5C-SHEETSET-E	A set of two products: MX Component, MX Sheet

MELSOFT MT Series

MT Developer	SW☐RNC-GSVPROE	Integrated start-up support software for Q Series motion controllers
	SW☐RNC-GSVSETE	Integrated start-up support software for Q Series motion controllers, A30CD-PCF (SSC I/F card), Q170CDCBL03M cable

MELSOFT MR Series

MR Configurator (Note 7)	MRZJW3-SETUP221	Servo setup software for PC

For details on GOT and software, refer to the Mitsubishi Graphic Operation Terminal GOT1000 catalog L(NA)08054.

GOT

GT15	GT1595	GT1595-XTBA	15", XGA (1024 x 768 dots), TFT color liquid crystal display (high intensity, wide angle view), 65536 colors, AC type
		GT1595-XTBD	15", XGA (1024 x 768 dots), TFT color liquid crystal display (high intensity, wide angle view), 65536 colors, DC type

Software

GT Designer2 Version2	SW2D5C-GTD2-E	Drawing software: GT Designer2 Version2 Easy data conversion: GT Converter2 Version2 SoftGOT function: GT SoftGOT1000 Version2
GT Designer2 Version2	SW2D5C-GTWK2-E	Drawing software: GT Designer2 Version2 Simulator: GT Simulator2 Ver.2 Easy data conversion: GT Converter2 Version2 SoftGOT function: GT SoftGOT1000 Version2
GOT SoftGOT1000 License key (Note 8)	GT15-SGTKEY-U	For USB port
	GT15-SGTKEY-P	For parallel port

Note 1) "Positive common" means using the module by connecting the common terminal to positive DC power; "negative common" means using the module by connecting the common terminal to negative DC power.
Note 2) The connector is not enclosed. Prepare A6CON1, A6CON2, A6CON3, or A6CON4 separately.
Note 3) The connector is not enclosed. Prepare A6CON1E, A6CON2E, or A6CON3E separately.
Note 4) The connector is not enclosed. Prepare A6CON1, A6CON2, or A6CON4 separately.
Note 5) The connector is not enclosed. Prepare A6CON4 separately.
Note 6) Runs in Windows command prompt.
Note 7) MRZJW3-SETUP211 does not support MR-J3-500A or later and MR-J3-B. Use MRZJW3-SETUP221 or later.
Note 8) To use GT SoftGOT1000, a GT SoftGOT1000 license key is required for each PC.
Note 9) If the GL or DNV shipping standard compliance is required, select the Q64P model.
Note 10) Depending on the combination of the power supply module and base unit, the mounting position (slot) of the Q68TD-G-H01 is restricted. Refer to the manual for more details.

Mitsubishi Programmable Controllers

Precautions for Choosing the Products

This publication explains the typical features and functions of the Q Series programmable controllers and does not provide restrictions and other information on usage and module combinations. When using the products, always read the user's manuals of the products.

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; opportunity loss or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

⚠ For safe use

- To use the products given in this publication properly, always read the "manuals" before starting to use them.
- The products have been manufactured as general-purpose parts for general industries, and have not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the products for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi.
- The products have been manufactured under strict quality control. However, when installing the products where major accidents or losses could occur if the products fail, install appropriate backup or failsafe functions in the system.

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